# HIGHLIGHTS

**REVISION NO. 33** Jun 01/10

Pages which have been revised are outlined below, together with the Highlights of the Revision

| CH/SE/SU PAGES | C | REASON FOR CHANGE | EFFECTIVITY |
|---|---|---|---|
| CHAPTER 23 | | | |
| L.E.P. 1- 7 | | Revised to Reflect this revision indicating new,revised, and/or deleted pages | |
| T. OF C. 2- 3 | | Revised to reflect this revision | |
| 23-11-00 501, 503 | | Minor additions and amplification<br>**ADDED "SSB POSITION" OPTION FOR FUNCTION SELECTOR SWITCH.** | |
| 23-12-00 35, 38- 39, 48- 56 | 02 | Effectivity updated at the bottom of the page | |
| 23-12-11 408 | | Minor additions and amplification<br>**CHANGED REFERENCE TO AMM 231200 PB501** | |
| 23-24-00 1 | | Reprinted | |
| 23-24-00 201 | | Reprinted | |
| 23-31-00 510- 514 | | Minor additions and amplification<br>**PARA.3.B.(2)(A)2. ADJUST POTENTIOMETER ADDED THE RESISTANCE (0 -4 KOHM).**<br>**PARA.3.B.(2)(A)3. ADJUST POTENTIOMETER ADDED THE RESISTANCE (0 -2 KOHM).** | |
| 23-71-00 501, 503, 505 | | Layout Improved or Effectivity Updated | |
| 23-71-00 601- 602 | | Layout Improved or Effectivity Updated | |



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CHAPTER 23

COMMUNICATIONS

LIST OF EFFECTIVE PAGES

N, R or D indicates pages which are New, Revised or Deleted respectively
Remove and insert the affected pages and complete the Record of Revisions and the Record of Temporary Revisions as necessary

| CH/SE/SU | C | PAGE | DATE |
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| RECORD | | | |
| OF TEMP. | | | |
| REVISION | | | |
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| L.E.P. | R | 1- 7 | Jun01/10 |
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| VHF Transceiver | | | 8 | 101-104, |
| Test | | | 20 | 101-104, |
| VHF Control Unit | | | 25 | 101-104, |
| Characteristics | | | 25 | 101-104, |
| VHF Antenna | | | 27 | 101-104, |
| Description | | | 27 | 101-104, |
| Operation | | | 30 | 101-104, |
| VHF SYSTEM | 23-12-00 | 02 | | |
| Description and Operation | | | 1 | 001-100,105-200, |
| General | | | 1 | 001-100,105-200, |
| Component Location | | | 1 | 001-100,105-200, |
| System Description | | | 1 | 001-100, |
| System Description | | | 5 | 105-200, |




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| SUBJECT | CH/SE/SU | C | PAGE | EFFECTIVITY |
|---|---|---|---|---|
| Electrical Power Supply | | | 5 | 001-100,105-200, |
| VHF1 System | | | 5 | 001-100,105-200, |
| VHF2 System | | | 5 | 001-100, |
| VHF3 System | | | 5 | 001-100, |
| VHF2 System | | | 8 | 105-200, |
| VHF3 System | | | 8 | 105-200, |
| Operation | | | 8 | 001-100,105-200, |
| Associated Peripheral Systems | | | 8 | 001-100, |
| Associated Peripheral Systems | | | 11 | 105-200, |
| VHF Transceiver | | | 11 | 105-200, |
| Description | | | 11 | 105-200, |
| VHF Transceiver | | | 12 | 001-100, |
| Description | | | 12 | 001-100, |
| Characteristics | | | 13 | 001-100, |
| Operation | | | 13 | 001-100, |
| Characteristics | | | 16 | 105-200, |
| Operation | | | 17 | 105-200, |
| Test | | | 38 | 105-200, |
| Test | | | 38 | 001-100, |
| VHF Control Unit | | | 39 | 001-100,105-200, |
| Description | | | 39 | 001-100,105-200, |
| Characteristics | | | 48 | 001-004, |
| Characteristics | | | 48 | 005-100, |
| Characteristics | | | 48 | 105-200, |
| Utilization | | | 50 | 001-100, |
| Utilization | | | 51 | 105-200, |
| Operation | | | 51 | 001-100, |
| Operation | | | 51 | 105-200, |
| Display Test | | | 54 | 001-100,105-200, |
| VHF Antenna | | | 55 | 001-100,105-200, |
| Description | | | 55 | 001-100,105-200, |
| Operation | | | 55 | 001-100,105-200, |
| VHF SYSTEM | 23-12-00 01 | | | |
| Adjustment/Test | | | 501 | 101-104, |
| Operational Test | | | 501 | 101-104, |
| VHF SYSTEM | 23-12-00 02 | | | |
| Adjustment/Test | | | 501 | 001-100,105-200, |
| Operational Test | | | 501 | 001-100,105-200, |
| VHF ANTENNA | 23-12-11 | | | |
| Removal/Installation | | | 401 | ALL |
| VHF CONTROL UNIT (2RC1, 2RC2, 2RC3) | 23-12-13 | | | |
| Removal/Installation | | | 401 | ALL |
| VHF TRANSCEIVER (1RC1, 1RC2, 1RC3) | 23-12-33 | | | |
| Removal/Installation | | | 401 | 001-100,105-200, |
| Removal/Installation | | | 401 | 101-104, |
| SELECTIVE CALLING SYSTEM | 23-22-00 01 | | | |
| Description and Operation | | | 1 | 101-104, |
| General | | | 1 | 101-104, |
| Component Location | | | 1 | 101-104, |
| System Description | | | 1 | 101-104, |
| Electrical Power Supply | | | 1 | 101-104, |
| Operation | | | 4 | 101-104, |

| | SUBJECT | CH/SE/SU | C | PAGE | EFFECTIVITY |
|---|---|---|---|---|---|
| | Associated Peripheral Systems | | | 4 | 101-104, |
| | SELCAL Decoder | | | 7 | 101-104, |
| | SELCAL Code Selection Panel | | | 12 | 101-104, |
| | SELECTIVE CALLING SYSTEM | 23-22-00 | 02 | | |
| | Description and Operation | | | 1 | 001-100,105-200, |
| | General | | | 1 | 001-100,105-200, |
| | Component Location | | | 1 | 001-100,105-200, |
| | System Description | | | 1 | 001-100,105-200, |
| | Electrical Power Supply | | | 1 | 001-100,105-200, |
| | Operation | | | 4 | 001-100,105-200, |
| | Associated Peripheral Systems | | | 4 | 001-100,105-200, |
| | SELCAL Decoder | | | 7 | 001-100,105-200, |
| | SELCAL Code Selection Panel | | | 16 | 001-100,105-200, |
| | SELCAL SYSTEM | 23-22-00 | | | |
| | Adjustment/Test | | | 501 | ALL |
| | Operational Test | | | 501 | ALL |
| | SELCAL DECODER (1RW) | 23-22-34 | | | |
| | Removal/Installation | | | 401 | ALL |
| | SELCAL CODE SELECTION PANEL (4RW) | 23-22-35 | | | |
| | Removal/Installation | | | 401 | ALL |
| | | | | | |
| R | ARINC COMMUNICATION ADDRESSING AND REPORTING SYSTEM (ACARS) | 23-24-00 | | | |
| R | Description and Operation | | | 1 | 105-200, |
| | General | | | 1 | 105-200, |
| | Component Location | | | 1 | 105-200, |
| | System Description | | | 1 | 105-200, |
| | Component Description | | | 1 | 105-200, |
| | VHF3 Transceiver | | | 1 | 105-200, |
| | ACARS Control and Display Units | | | 1 | 105-200, |
| | ACARS Management Unit | | | 9 | 105-200, |
| | ACARS printer | | | 9 | 105-200, |
| | Maintenance Practices | | | 201 | 105-200, |
| | PASSENGER ADDRESS AND ENTERTAINMENT | 23-30-00 | | | |
| | Description and Operation | | | 1 | ALL |
| | General | | | 1 | ALL |
| | Description | | | 1 | 101-200, |
| | Description | | | 2 | 001-100, |
| | | | | | |
| | PASSENGER ADDRESS SYSTEM | 23-31-00 | | | |
| | Description and Operation | | | 1 | ALL |
| | General | | | 1 | ALL |
| | Component Location | | | 1 | ALL |
| | System Description | | | 15 | ALL |
| | Component Description | | | 31 | ALL |
| | System Operation | | | 41 | ALL |
| | Test | | | 48 | ALL |
| | Adjustment/Test | | | 501 | ALL |
| | Operational Test | | | 501 | ALL |
| | Adjustment of Potentiometers | | | 509 | 101-200, |
| | Adjustment of Potentiometers | | | 511 | 001-100, |
| | Adjustment of Transformers for | | | 513 | ALL |




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| SUBJECT | CH/SE/SU | C | PAGE | EFFECTIVITY |
|---|---|---|---|---|
| Loudspeakers. | | | | |
| Measurement of the PA-Sound Level | | | 516 | ALL |
| PASSENGER ADDRESS AMPLIFIER | 23-31-18 | | | |
| Removal/Installation | | | 401 | ALL |
| PASSENGER COMPARTMENT LOUDSPEAKERS | 23-31-25 | | | |
| Removal/Installation | | | 401 | ALL |
| LAVATORY LOUDSPEAKERS | 23-31-26 | | | |
| Removal/Installation | | | 401 | ALL |
| ANNOUNCEMENT - MUSIC TAPE REPRODUCER SYSTEM | 23-32-00 | | | |
| Description and Operation | | | 1 | ALL |
| General | | | 1 | ALL |
| Component Location | | | 1 | ALL |
| System Description | | | 1 | 101-200, |
| System Description | | | 4 | 001-100, |
| Component Description | | | 5 | 101-200, |
| Component Description | | | 11 | 001-100, |
| System Operation | | | 22 | 101-200, |
| System Operation | | | 22 | 001-100, |
| Adjustment/Test | | | 501 | ALL |
| Operational Test | | | 501 | ALL |
| TAPE REPRODUCER | 23-32-12 | | | |
| Removal/Installation | | | 401 | 001-100, |
| PASSENGER ENTERTAINMENT (MUSIC) | 23-33-00 | 01 | | |
| Description and Operation | | | 1 | 001-100, |
| GENERAL | | | 1 | 001-100, |
| Component Location | | | 1 | 001-100, |
| System Description | | | 13 | 001-100, |
| Power Supply | | | 13 | 001-100, |
| Component Description | | | 13 | 001-100, |
| System Operation | | | 28 | 001-100, |
| PASSENGER ENTERTAINMENT (MUSIC) | 23-33-00 | 02 | | |
| Description and Operation | | | 1 | 101-200, |
| GENERAL | | | 1 | 101-200, |
| Component Location | | | 1 | 101-200, |
| System Description | | | 31 | 101-200, |
| Component Description | | | 31 | 101-200, |
| Power Supply | | | 40 | 101-200, |
| System Operation | | | 44 | 101-200, |
| PASSENGER ENTERTAINMENT - MUSIC | 23-33-00 | 01 | | |
| Adjustment/Test | | | 501 | 001-100, |
| Operational Test | | | 501 | 001-100, |
| PASSENGER ENTERTAINMENT (MUSIC) | 23-33-00 | 02 | | |
| Adjustment/Test | | | 501 | 101-200, |
| Operational Test | | | 501 | 101-200, |
| REPRODUCER-AUDIO (10MK) | 23-33-12 | | | |
| Removal/Installation | | | 401 | 001-100, |
| MULTIPLEXER - MAIN (8MK) | 23-33-15 | | | |
| Removal/Installation | | | 401 | 001-100, |
| BITE PANEL | 23-33-17 | | | |

| | SUBJECT | CH/SE/SU | C | PAGE | EFFECTIVITY |
|---|---|---|---|---|---|
| | Removal/Installation | | | 401 | 101-200, |
| | ZONE CONTROL UNIT | 23-33-18 | | | |
| | Removal/Installation | | | 401 | 101-200, |
| | MASTER ATTENDANT PASSENGER | 23-33-19 | | | |
| | Removal/Installation | | | 401 | 101-200, |
| | PASSENGER ENTERTAINMENT (VIDEO) | 23-36-00 | | | |
| | Description and Operation | | | 1 | ALL |
| | General | | | 1 | 001-100, |
| | General | | | 1 | 101-200, |
| | Component Location | | | 1 | ALL |
| | System Description | | | 9 | 001-100, |
| | System Description | | | 9 | 101-104, |
| R | System Description | | | 9 | 105-200, |
| | Component Description | | | 10 | 001-100, |
| | Component Description | | | 10 | 101-200, |
| | System Power Supply | | | 26 | 001-100, |
| | Power Supply | | | 26 | 101-200, |
| | System Operation | | | 26 | 001-100, |
| | System Operation | | | 33 | 101-104, |
| R | System Operation | | | 33 | 105-200, |
| | Adjustment/Test | | | 501 | ALL |
| | Operational Test | | | 501 | ALL |
| | VIDEO MONITOR | 23-36-13 | | | |
| | Removal/Installation | | | 401 | 001-100, |
| | LCD MONITOR | 23-36-14 | | | |
| | Removal/Installation | | | 401 | 001-100,105-200, |
| | SYSTEM CONTROL UNIT | 23-36-21 | | | |
| | Removal/Installation | | | 401 | 001-100, |
| | VIDEO TAPE REPRODUCER | 23-36-22 | | | |
| | Removal/Installation | | | 401 | 001-100, |
| | PASSENGER INFO - AIRSHOW | 23-37-00 | | | |
| | Description and Operation | | | 1 | ALL |
| | General | | | 1 | 101-200, |
| | General | | | 1 | 001-100, |
| | Component Location | | | 1 | ALL |
| | System Description | | | 4 | 001-100, |
| | System Description | | | 4 | 101-200, |
| | System Power Supply | | | 4 | 001-100, |
| | System Power Supply | | | 7 | 101-200, |
| | Component Description | | | 7 | 001-100, |
| | Component Description | | | 10 | 101-200, |
| | System Operation | | | 12 | 001-100, |
| | System Operation | | | 15 | 101-200, |
| | Adjustment/Test | | | 501 | ALL |
| | AIRSHOW CONTROL UNIT | * 23-37-11 | | | |
| | Removal/Installation | * | | 401 | 101-200, |
| | PASSENGER SERVICE SYSTEM | 23-38-00 | | | |
| | Description and Operation | | | 1 | 101-200, |
| | General | | | 1 | 101-200, |

| SUBJECT | CH/SE/SU | C | PAGE | EFFECTIVITY |
|---|---|---|---|---|
| Component Location | | | 1 | 101-200, |
| System Description | | | 5 | 101-200, |
| Component Description | | | 5 | 101-200, |
| Operation | | | 6 | 101-200, |
| Adjustment/Test | | | 501 | 101-200, |
| OVERHEAD DECODER UNIT | 23-38-11 | | | |
| Removal/Installation | | | 401 | 101-200, |
| FLIGHT INTERPHONE | 23-41-00 | | | |
| Description and Operation | | | 1 | ALL |
| General | | | 1 | ALL |
| Component Location | | | 1 | ALL |
| System Description | | | 1 | ALL |
| Electrical Power Supply | | | 1 | ALL |
| Operation | | | 1 | ALL |
| Associated Peripheral Systems | | | 6 | ALL |
| Flight Interphone Amplifier | | | 6 | ALL |
| Description | | | 6 | ALL |
| Operation | | | 6 | ALL |
| Full Face Oxygen Mask Connection Box | | | 8 | ALL |
| Flight Interphone Jack | | | 8 | ALL |
| Adjustment/Test | | | 501 | ALL |
| Operational Test | | | 501 | ALL |
| GROUND CREW CALL SYSTEM | 23-42-00 | | | |
| Description and Operation | | | 1 | ALL |
| General | | | 1 | ALL |
| Component Location | | | 1 | ALL |
| System Description | | | 1 | ALL |
| Component Description | | | 1 | ALL |
| Operation | | | 6 | ALL |
| Adjustment/Test | | | 501 | ALL |
| Operational Test | | | 501 | ALL |
| INTERPHONE BOX (3WC) | 23-42-12 | | | |
| Removal/Installation | | | 401 | ALL |
| MECHANIC CALL HORN (4WC) | 23-42-21 | | | |
| Removal/Installation | | | 401 | ALL |
| CABIN AND FLIGHT CREW CALL SYSTEM | 23-43-00 | | | |
| Description and Operation | | | 1 | ALL |
| General | | | 1 | ALL |
| Component Location | | | 1 | ALL |
| System Description | | | 13 | ALL |
| Operation | | | 35 | 101-200, |
| Adjustment/Test | | | 501 | ALL |
| Adjustment of Handset-holder | | | 513 | ALL |
| JUNCTION BOX | 23-43-11 | | | |
| Removal/Installation | | | 401 | ALL |
| Replacement of Printed Circuit Board | | | 402 | ALL |
| HANDSET CRADLE | 23-43-12 | | | |
| Removal/Installation | | | 401 | ALL |

| SUBJECT | CH/SE/SU | C | PAGE | EFFECTIVITY |
|---|---|---|---|---|
| CABIN AND SERVICE INTERPHONE | 23-44-00 | | | |
| Description and Operation | | | 1 | ALL |
| General | | | 1 | ALL |
| Component Location | | | 1 | ALL |
| System Description | | | 2 | ALL |
| Electrical Power Supply | | | 7 | ALL |
| Operation | | | 7 | ALL |
| Service Interphone Amplifier | | | 18 | ALL |
| Service Interphone Jacks | | | 20 | ALL |
| Description | | | 20 | ALL |
| Operation | | | 20 | ALL |
| Adjustment/Test | | | 501 | ALL |
| Operational Test | | | 501 | ALL |
| MAINTENANCE INTERPHONE JACK | 23-44-12 | 01 | | |
| Removal/Installation | | | 401 | 101-200, |
| MAINTENANCE INTERPHONE JACK (D4974J) | 23-44-12 | 02 | | |
| Removal/Installation | | | 401 | 001-100, |
| AUDIO INTEGRATING | 23-50-00 | | | |
| Description and Operation | | | 1 | ALL |
| General | | | 1 | ALL |
| Component Location | | | 1 | ALL |
| System Description | | | 9 | ALL |
| Audio Intercommunication Unit | | | 9 | ALL |
| Audio Control Panel | | | 11 | ALL |
| Jack Panel | | | 13 | ALL |
| Jack Panel - Supplementary | | | 15 | 001-100, |
| Radio Reception Loudspeakers | | | 15 | ALL |
| Interphone/Radio Switches | | | 16 | ALL |
| Emergency Passenger Address Control Switches | | | 16 | ALL |
| Miscellaneous Acoustic Equipments | | | 17 | 101-200, |
| Miscellaneous Acoustic Equipment | | | 17 | 001-100, |
| Electrical Power Supply | | | 18 | ALL |
| Busbar 303PP | | | 18 | ALL |
| Busbar 306PP | | | 18 | ALL |
| Operation | | | 18 | ALL |
| Flight Interphone Amplifier Operation | | | 25 | ALL |
| VHF and HF Radio Communication Operation | | | 25 | ALL |
| Passenger Address System Operation | | | 25 | 101-200, |
| Passenger Address System Operation | | | 29 | 001-100,105-200, |
| Passenger Address System Operation | | | 29 | 101-104, |
| Navigation Reception Operation | | | 29 | ALL |
| AUDIO INTEGRATING | 23-51-00 | | | |
| Adjustment/Test | | | 501 | ALL |
| Operational Test | | | 501 | ALL |

| SUBJECT | CH/SE/SU | C | PAGE | EFFECTIVITY |
|---|---|---|---|---|
| Functional Test | | | 502 | ALL |
| Deactivation/Reactivation | | | 901 | ALL |
| Deactivation | | | 901 | ALL |
| Ref : MMEL Sect. 1-23, Item 6) | | | 901 | ALL |
| Reactivation | | | 903 | ALL |
| AUDIO CONTROL PANEL (2RN - 3RN - 4RN - 6RN) | 23-51-12 | | | |
| Removal/Installation | | | 401 | ALL |
| INTPH/RAD SWITCH (13RN, 14RN) | 23-51-17 | | | |
| Removal/Installation | | | 401 | ALL |
| AUDIO INTERCOMMUNICATION UNIT (1RN) | 23-51-18 | | | |
| Removal/Installation | | | 401 | ALL |
| JACK PANEL | 23-51-31 | | | |
| Removal/Installation | | | 401 | ALL |
| STATIC DISCHARGING | 23-60-00 | | | |
| Description and Operation | | | 1 | ALL |
| Inspection/Check | | | 601 | ALL |
| STATIC DISCHARGER | 23-61-11 | | | |
| Removal/Installation | | | 401 | ALL |
| STATIC DISCHARGER RETAINER | 23-61-21 | | | |
| Removal/Installation | | | 401 | ALL |
| COCKPIT VOICE RECORDER | 23-71-00 | | | |
| Description and Operation | | | 1 | ALL |
| General | | | 1 | ALL |
| Component Location | | | 1 | ALL |
| System Description | | | 5 | ALL |
| Component Description | | | 8 | ALL |
| Operation | | | 17 | ALL |
| Interface | | | 27 | ALL |
| Adjustment/Test | | | 501 | ALL |
| Operational Test | | | 501 | ALL |
| Functional Test | | | 501 | ALL |
| Operational Test of CVR by Depressing TEST Pushbutton | | | 501 | ALL |
| Operational Test to confirm Availability and Aural Quality of all Active CVR Channels | | | 502 | ALL |
| Operational Test of Time Delay Relay | | | 504 | ALL |
| Operational Test of Bulk Erase Function of CVR and Bulk Erase Inhibition Logic | | | 506 | ALL |
| Functional Test of Manual Erasure | | | 508 | ALL |
| Operational Test of Underwater Locator Beacon (ULB) | | | 515 | ALL |
| Inspection/Check | | | 601 | ALL |
| Operational Check | | | 601 | ALL |
| Procedure | | | 601 | ALL |
| COCKPIT VOICE RECORDER CONTROL UNIT 1RK | 23-71-12 | | | |

| SUBJECT | CH/SE/SU | C | PAGE | EFFECTIVITY |
|---|---|---|---|---|
| COCKPIT VOICE RECORDER MICROPHONE (14RK) | 23-71-13 | | | |
| Removal/Installation | | | 401 | ALL |
| COCKPIT VOICE RECORDER | 23-71-35 | | | |
| Removal/Installation | | | 401 | ALL |
| UNDERWATER LOCATING BEACON - | 23-71-36 | | | |
| Removal/Installation | | | 401 | 001-100, |
| Removal/Installation of Underwater Locating Beacon | | | 401 | 001-100, |
| AUDIO MIXING BOX (18RK) | 23-71-42 | | | |
| Removal/Installation | | | 401 | 004-200, |
| Equipment and Materials | | | 401 | 004-200, |
| Procedure | | | 401 | 004-200, |
| VIDEO MONITORING SYSTEM | 23-72-00 | | | |
| Description/Operation | | | 1 | 001-100, |
| Adjustment/Test | | | 501 | 001-100, |
| CAMERA - ANTI HIJACK SYSTEM | 23-72-51 | | | |
| Removal/Installation | | | 401 | 001-100, |




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1. General
The communication systems allow crew members to communicate with each other, with the passengers, other aircraft and the ground stations.

2. Description
The communication systems comprise :

A. Radio Equipment
(1)High frequency (HF) system (Ref. 23-11)
(Ref. Fig. 001)
Two transceivers and associated equipment allow voice communications within 2.8 to 24 MHz frequency range with 1 KHz spacing.

R **ON A/C 001-104,

(2)Very high frequency (VHF) system (Ref. 23-12)

R **ON A/C 105-200,

(2)Very high frequency (VHF1 and VHF2) system (Ref. 23-12) and ACARS system associated to VHF3 system (Ref. 23-24).

R **ON A/C 001-104,

(Ref. Fig. 002)

R **ON A/C 105-200,

(Ref. Fig. 003). *

R **ON A/C 001-104,

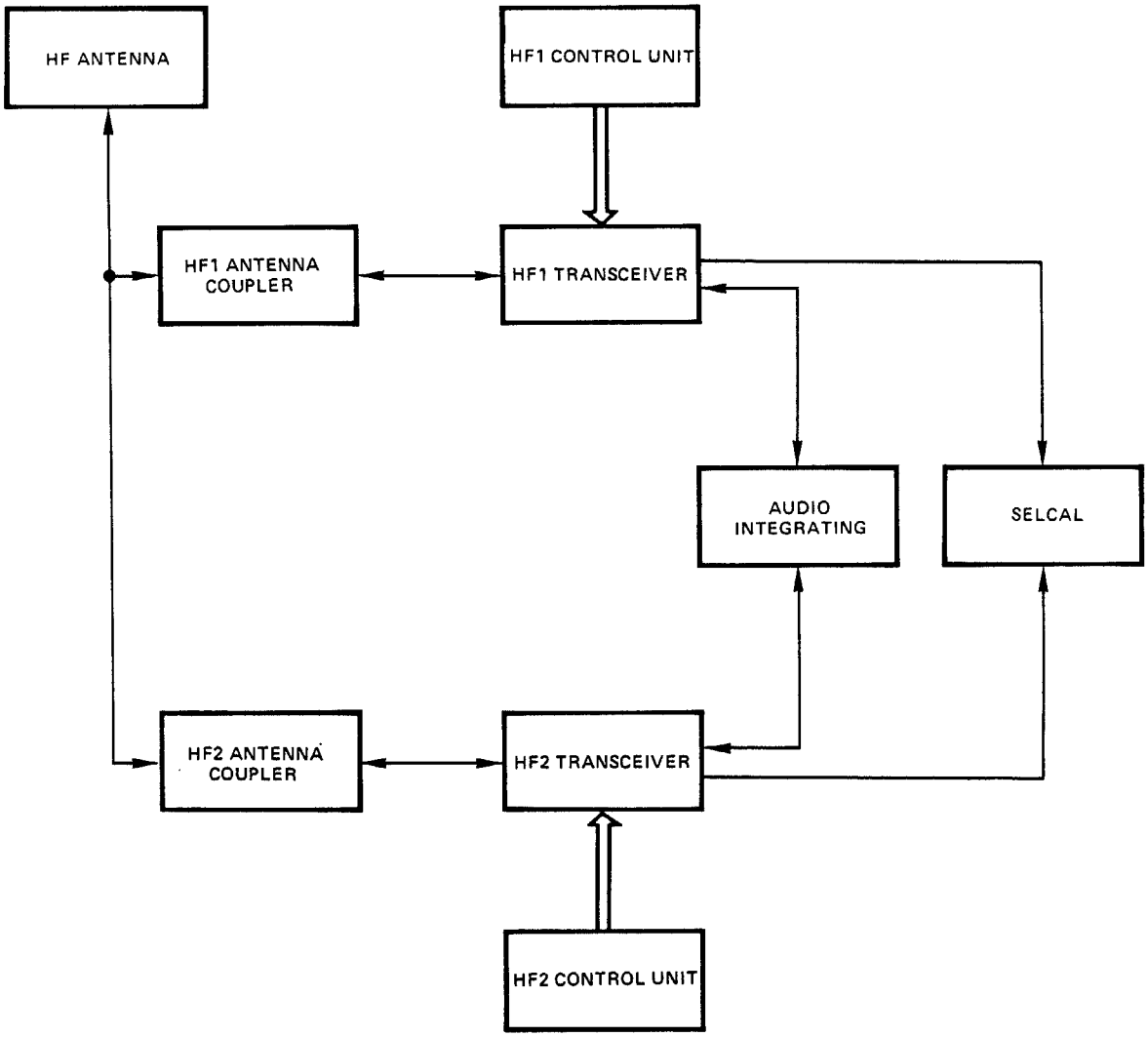
Three transceivers and associated equipment allow short range voice communications within 118 to 136.975 MHz frequency range with 25 KHz spacing.

R **ON A/C 105-200,

Two transceivers and associated equipment allow short range voice communications within 118 to 136.975 MHz frequency range with 25 KHz spacing.
VHF3 system shall be shared in between "VOICE" and "DATA" functions ; "VOICE" frequency display shall be through ACARS CDU.

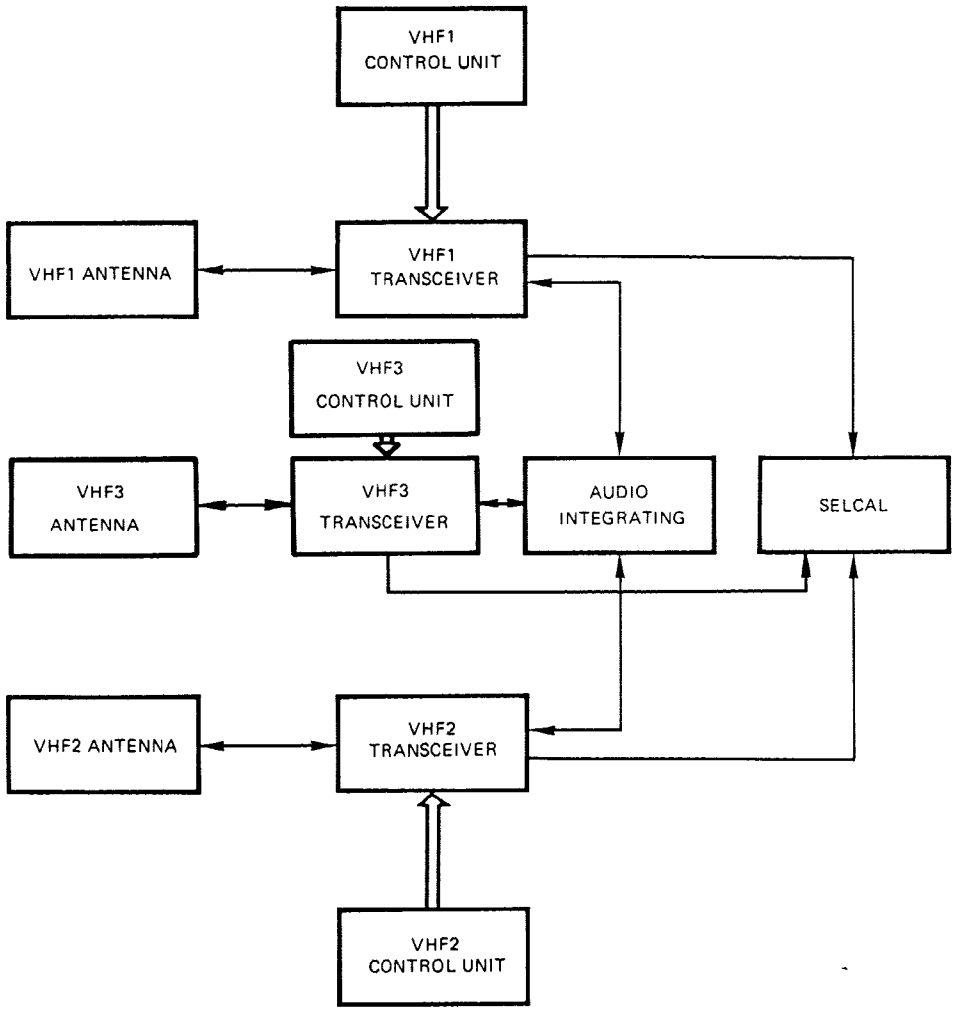
R **ON A/C ALL

(3)Selective calling (SELCAL) system (Ref. 23-22)
(Ref. Fig. 004)
The selective calling system allows aural and visual indicating of calls



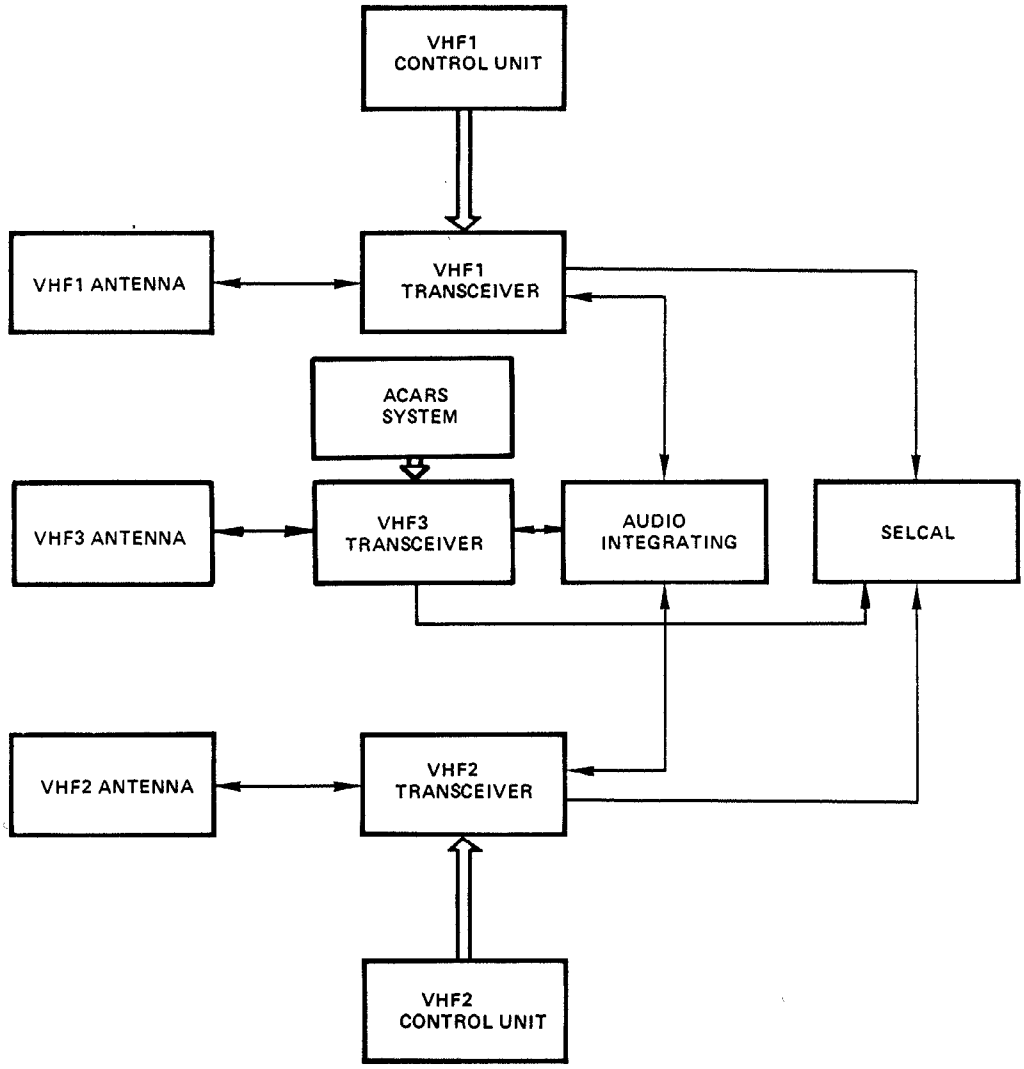

BM5 23 00 00 0 AAM0-00

HF System - Block Diagram
Figure 001




BM5 23 00 00 0 BCMO

VHF System - Block Diagram
Figure 002

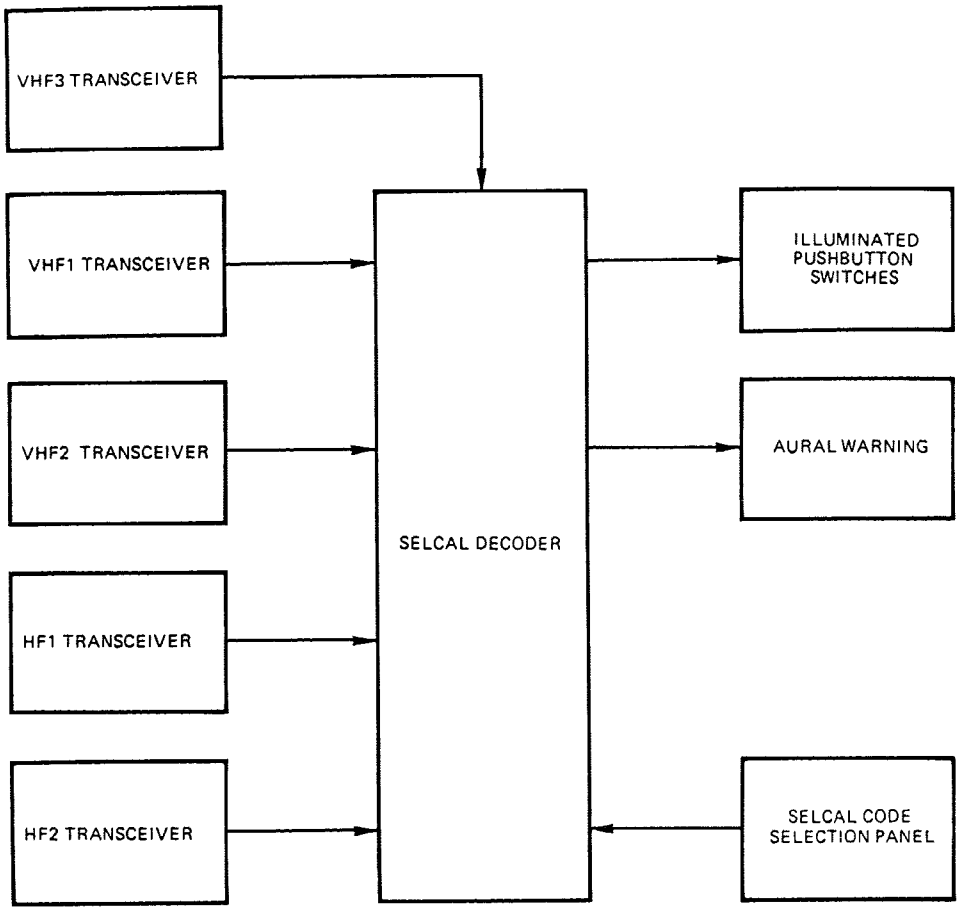



BM5 23 00 00 0 CDN0-23-18
DM5

VHF System - Block Diagram *
Figure 003

R EFFECTIVITY: 105-200,

PIA




BM5 23 00 00 0 BEXO

Selective Calling System - Block Diagram
Figure 004

transmitted by ground stations in the VHF and HF frequencies and obviates the need for the crew to constantly listen in on the ground station frequency.

B. Passenger Address and Entertainment
(1)Passenger address (Ref. 23-31).
(Ref. Fig. 005)
The passenger address system enables crew members and Cabin Attendants to transmit instructions and announcements to passengers.
(2)Announcement - music tape reproducer system (Ref. 23-32)
The combined announcements and music tape system is designed to automatically provide recorded announcements and music programs. The tape reproducer system is controlled by an attendant control unit and the system audio output is broadcast through the aircraft passenger address system.
NOTE : Boarding music (BGM) can be selected via the announcement - music tape reproducer system.
(Ref. Fig. 006)

C. Interphone System
(1)Flight Interphone (Ref. 23-41)

**ON A/C 101-200,

(Ref. Fig. 007)

**ON A/C 001-100,

(Ref. Fig. 008)

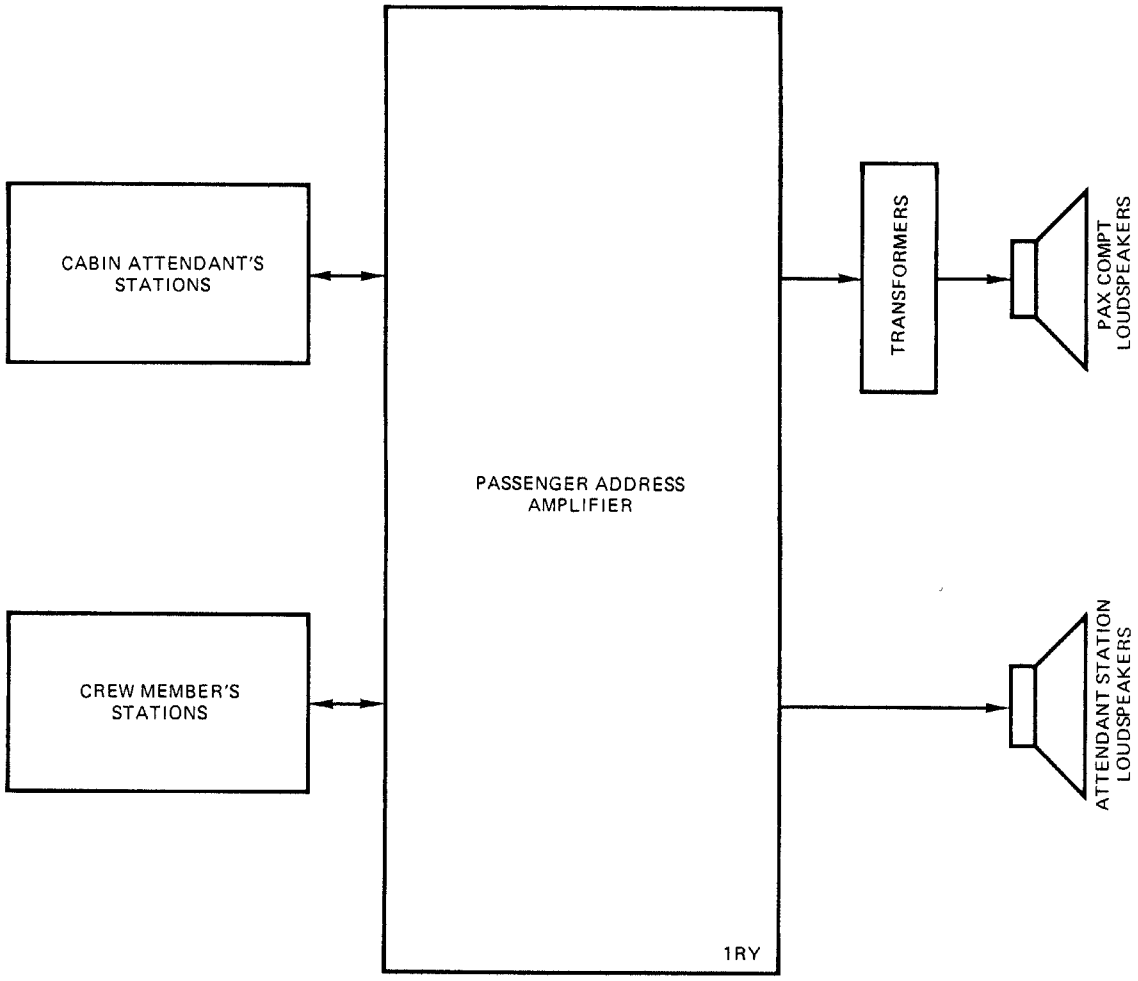
**ON A/C ALL

The flight interphone system allows telephone communications between :
- the various crew members
- the crew members and the ground mechanic from the ground power receptacle housing.

(2)Ground crew call system (Ref. 23-42)
(Ref. Fig. 009)
The ground crew call system allows the flight crew to call the ground mechanics and vice versa.
(3)Service interphone (Ref. 23-44)
(Ref. Fig. 010)
The service interphone system allows communications between :
- the cabin attendants
- the cabin attendants and the crew members
- the cabin attendants or the crew members and the various parts of the aircraft fitted with service interphone jacks.

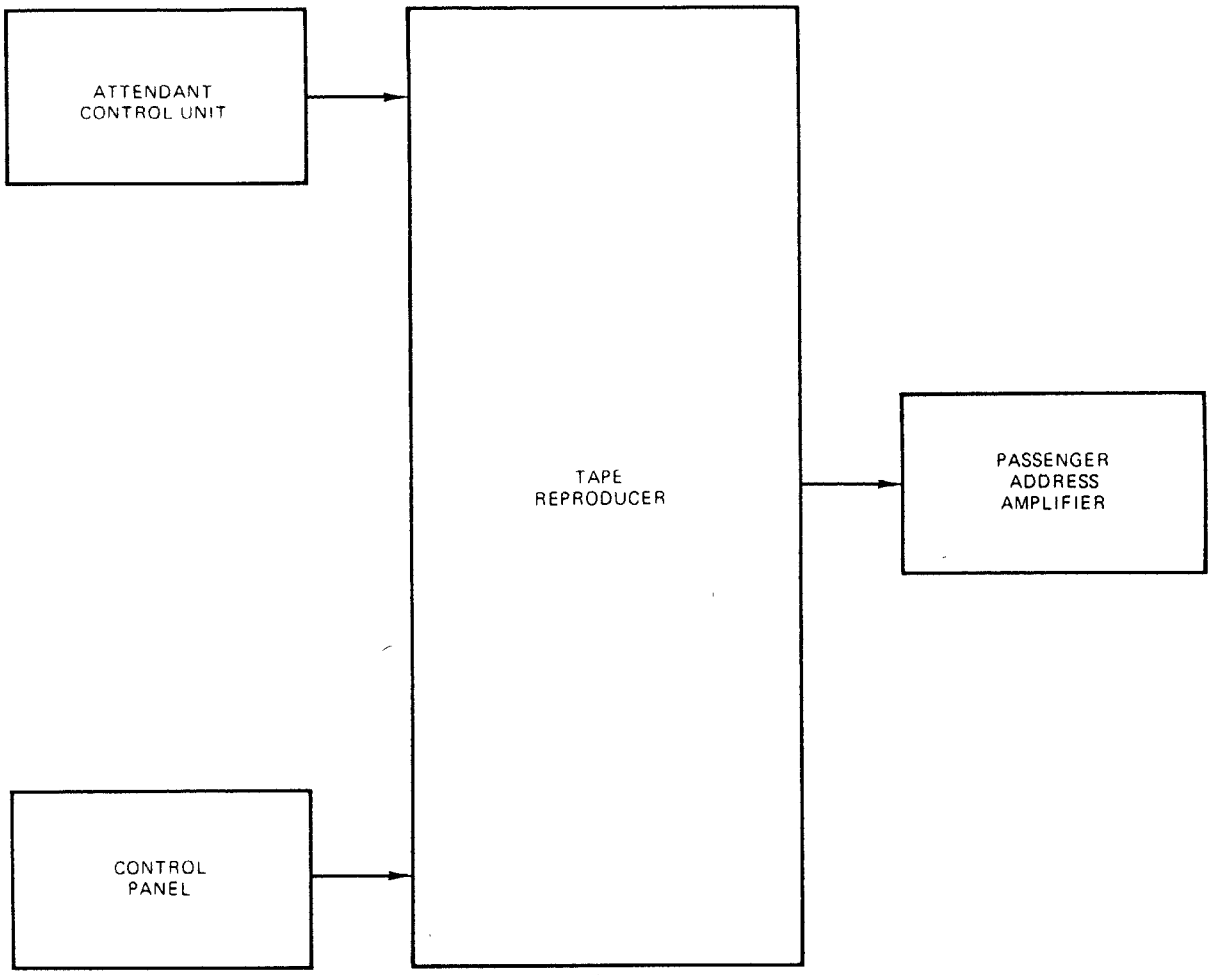
(4)Audio integrating (Ref. 23-51)

**ON A/C 101-200,



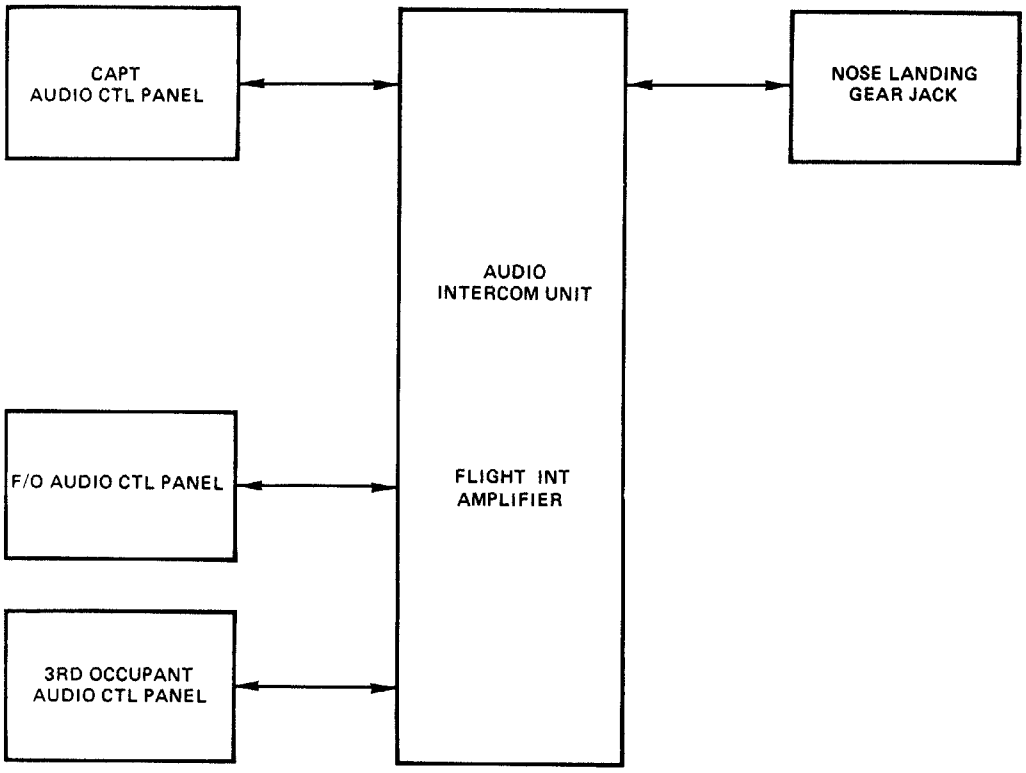

BM5 23 00 00 0 AFM0 09 04
DM5

Passenger Address - Block Diagram
Figure 005



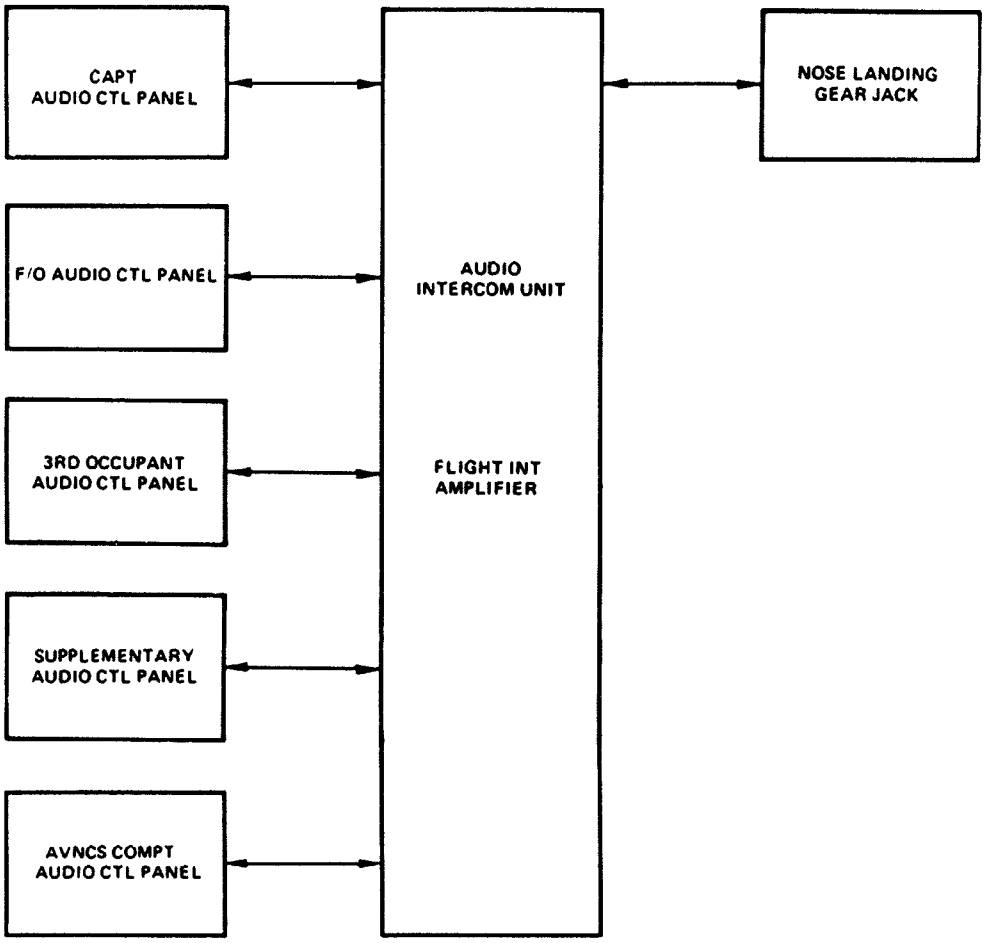

RM5 23 00 00 0 AFP0 08

Announcement - Music Tape Reproducer - Block Diagram
Figure 006



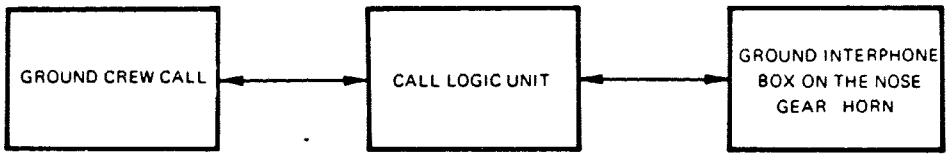

BM5 23 00 00 0 AGFO 10 08
DM5

Flight Interphone - Block Diagram
Figure 007



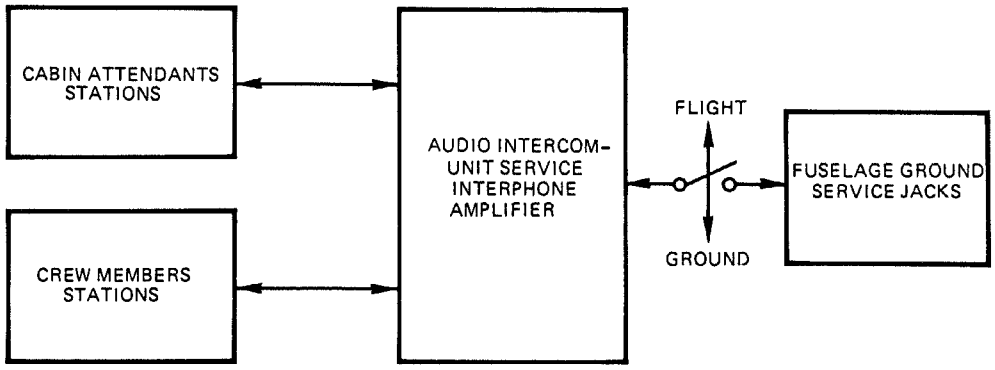

BM5 23 00 00 0 AGR0 13

Flight Interphone - Block Diagram
Figure 008




8M5 23 00 00 0 AJMO

Ground Crew Call System - Block Diagram
Figure 009




BM5 23 00 00 0 ALMO
DM5

Service Interphone - Block Diagram
Figure 010

(Ref. Fig. 011)

**ON A/C 001-100,

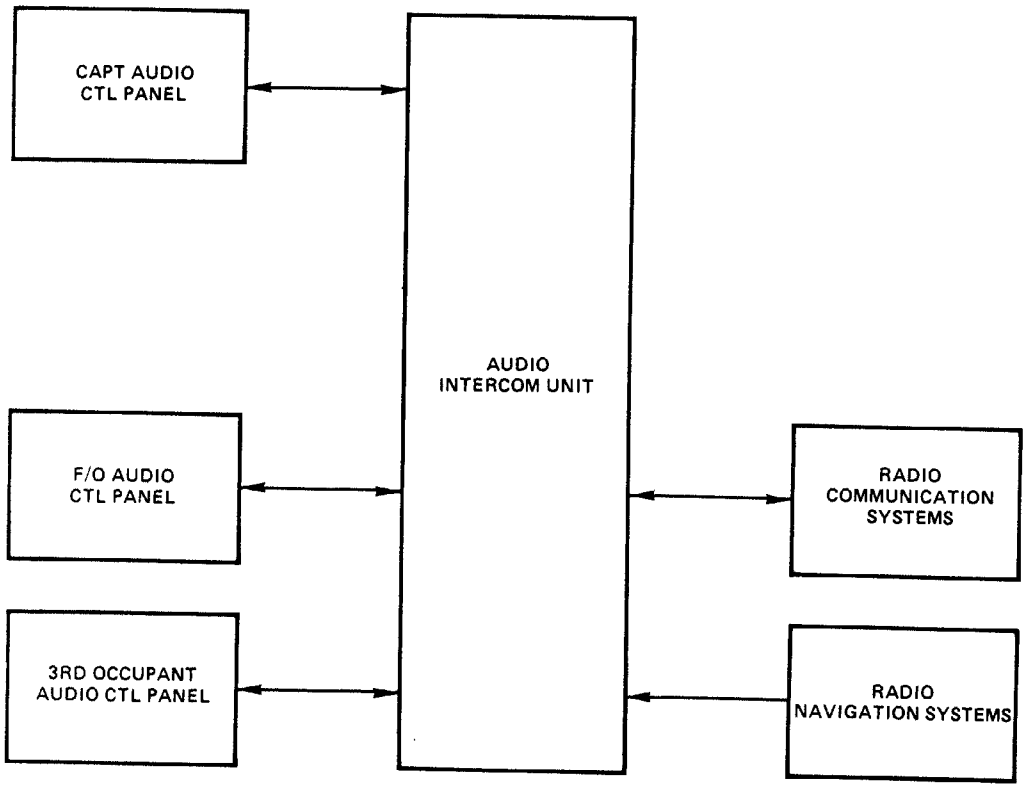
(Ref. Fig. 012)

**ON A/C ALL

The audio integrating system enables selection for reception and transmission through all the radio communication and radio navigation systems installed on the aircraft.

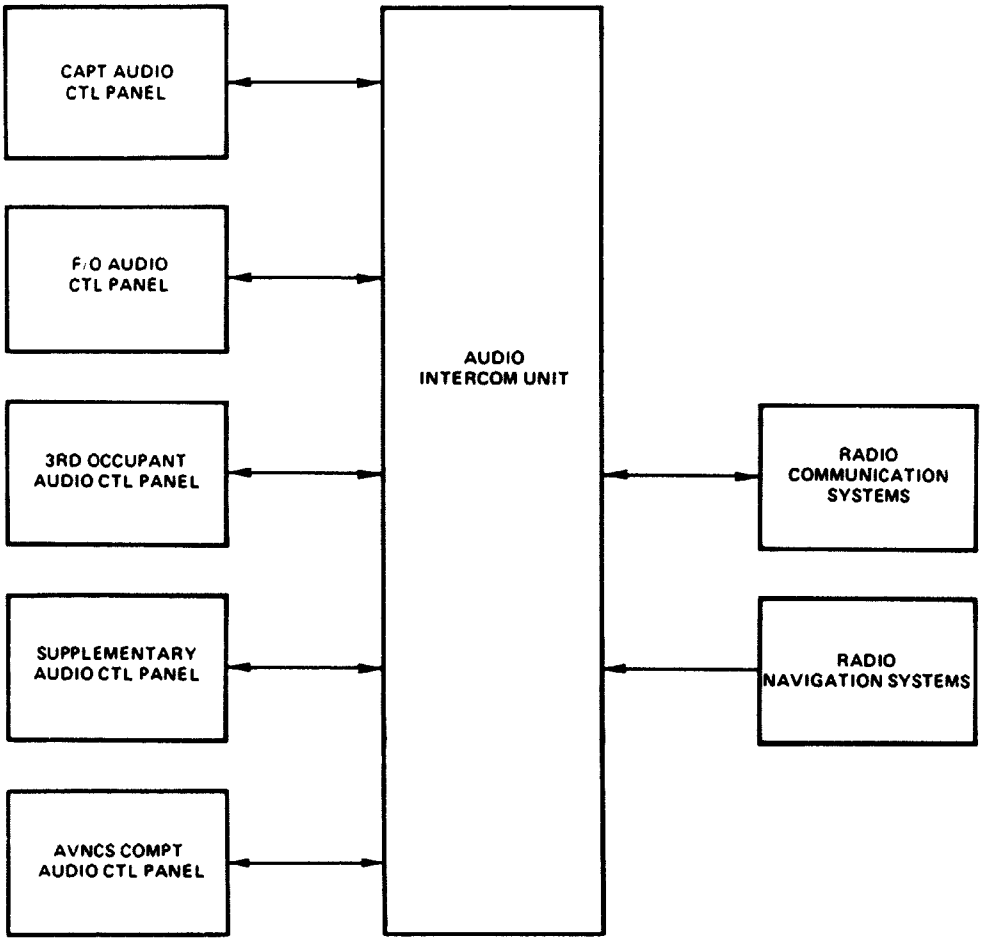
(5)Static dischargers (Ref. 23-61)
(Ref. Fig. 013)
Static electricity charges transmitted to the static dischargers are dispersed through the "CORONA effect" so that radio navigation and radio communication systems are not disturbed.
(Ref. Fig. 014)

(6)Cockpit voice recorder (Ref. 23-71)
The cockpit voice recorder records communications, aural warnings and crew conversations during flight for playback in case of accident.



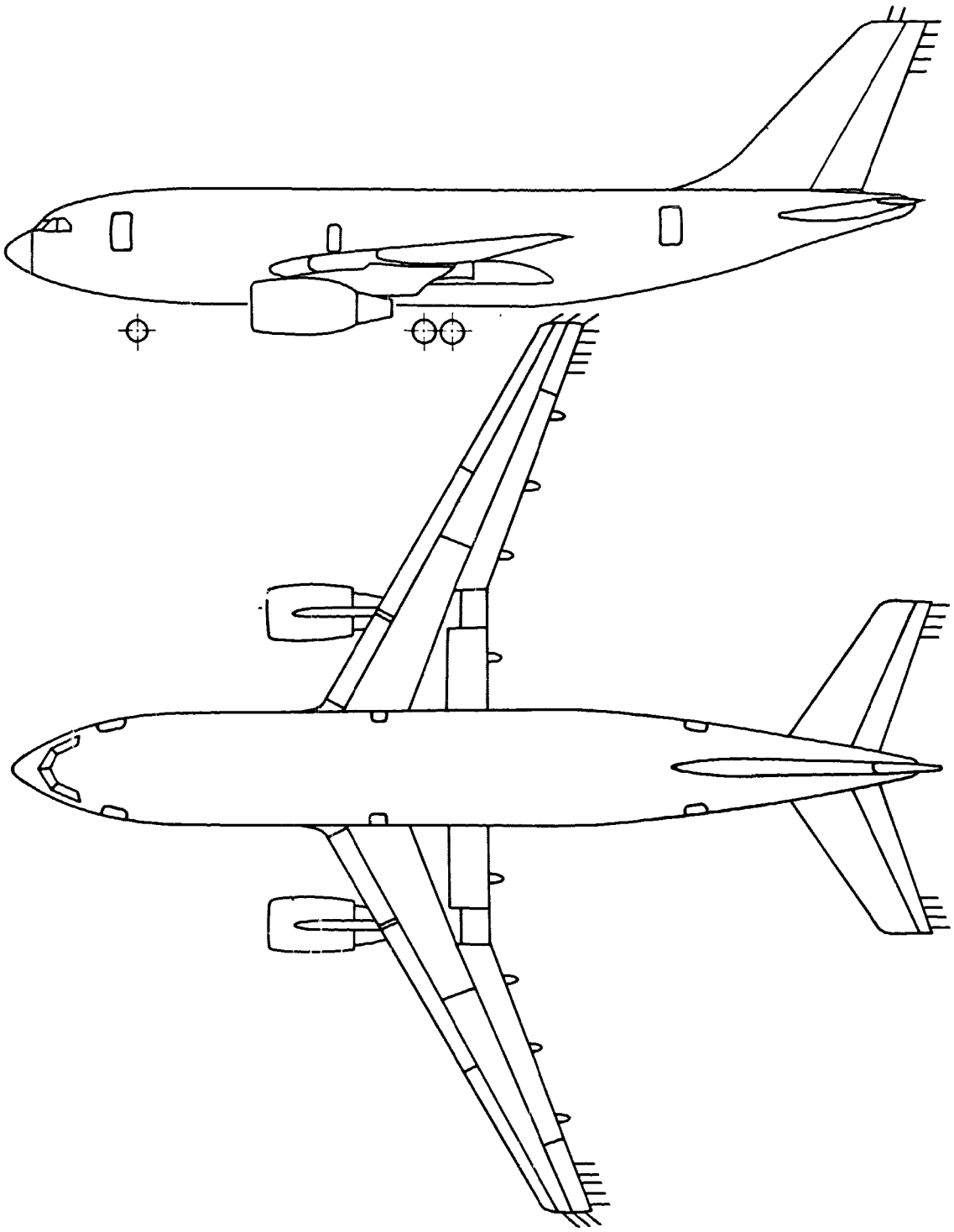

BM5 23 00 00 0 AMMO 10 08
DM5

Audio Integrating - Block Diagram
Figure 011



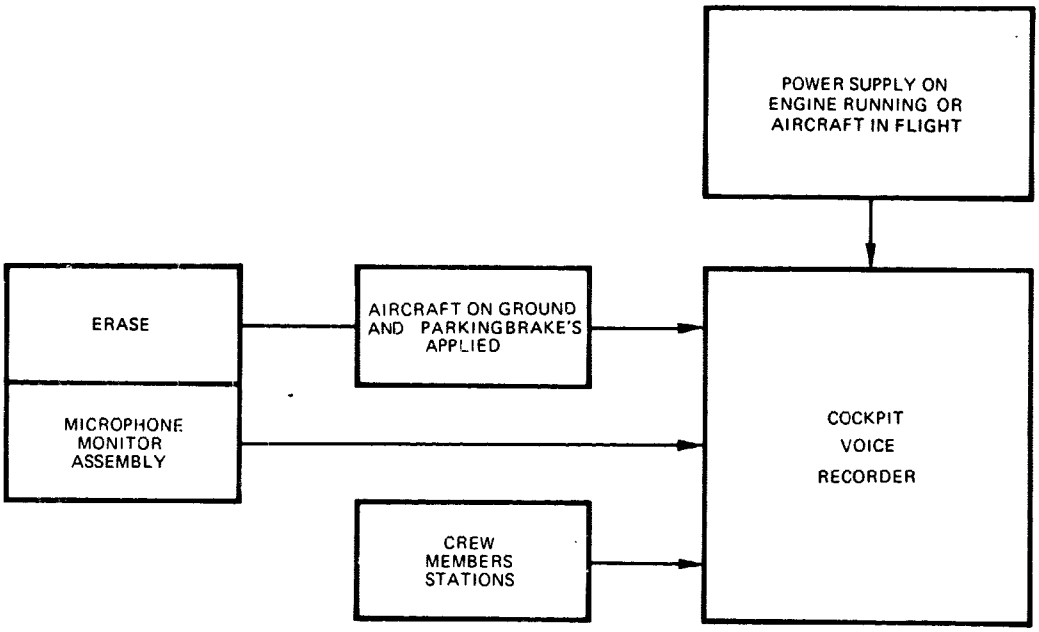

BM5 23 00 00 0 ANR0 13

Audio Integrating - Block Diagram
Figure 012



BM5 23 00 00 0 AQM0

Static Dischargers - Location
Figure 013




BM5 23 00 00 0 ASMO

Cockpit Voice Recorder - Block Diagram
Figure 014

R HF SYSTEM - DESCRIPTION AND OPERATION
R

1. General
   The High Frequency (HF) system serves for all long-distance voice communications between different aircraft in flight, between aircraft in flight or on the ground and ground stations. The aircraft is equipped with two identical HF systems including an antenna common to both systems.
2. Component Location

**ON A/C 101-200,

(Ref. Fig. 001)

**ON A/C 001-100,

(Ref. Fig. 002)

**ON A/C 101-200,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 1RE1 | TRANSCEIVER-HF,1 | 95VU | 122 | 121BL | 23-11-33 |
| 1RE2 | TRANSCEIVER-HF,2 | 95VU | 122 | 121BL | 23-11-33 |
| 2RE1 | CTL UNIT-HF,1 | 11VU | 210 | | 23-11-13 |
| 2RE2 | CTL UNIT-HF,2 | 11VU | 210 | | 23-11-13 |
| 3RE1 | MFA-HF1/XMTR FAULT | 47OVU | 212 | | |
| 3RE2 | MFA-HF2/XMTR FAULT | 47OVU | 212 | | |
| 5RE1 | MFA-HF1/CPLR FAULT | 47OVU | 212 | | |
| 5RE2 | MFA-HF2/CPLR FAULT | 47OVU | 212 | | |
| 6RE1 | MOUNT-HF TRANSCEIVER 1 | 95VU | 122 | | 23-11-37 |
| 6RE2 | MOUNT-HF TRANSCEIVER 2 | 95VU | 122 | | 23-11-37 |
| 7RE1 | ANTENNA COUPLER-HF,1 | | 323 | | 23-11-36 |
| 7RE2 | ANTENNA COUPLER-HF,2 | | 323 | | 23-11-36 |
| 9RE | ANTENNA-HF | | 323 | | 23-11-11 |

**ON A/C 001-100,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 1RE1 | TRANSCEIVER-HF,1 | 95VU | 122 | 121BL | 23-11-33 |
| 1RE2 | TRANSCEIVER-HF,2 | 95VU | 122 | 121BL | 23-11-33 |

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 2RE1 | CTL UNIT-HF,1 | 20VU | 210 | | 23-11-13 |
| 2RE2 | CTL UNIT-HF,2 | 20VU | 210 | | 23-11-13 |
| 3RE1 | MFA-HF1/XMTR FAULT | 47OVU | 212 | | |
| 3RE2 | MFA-HF2/XMTR FAULT | 47OVU | 212 | | |
| 5RE1 | MFA-HF1/CPLR FAULT | 47OVU | 212 | | |
| 5RE2 | MFA-HF2/CPLR FAULT | 47OVU | 212 | | |
| 6RE1 | MOUNT-HF TRANSCEIVER 1 | 95VU | 122 | | 23-11-37 |
| 6RE2 | MOUNT-HF TRANSCEIVER 2 | 95VU | 122 | | 23-11-37 |
| 7RE1 | ANTENNA COUPLER-HF,1 | | 323 | | 23-11-36 |
| 7RE2 | ANTENNA COUPLER-HF,2 | | 323 | | 23-11-36 |
| 9RE | ANTENNA-HF | | 323 | | 23-11-11 |

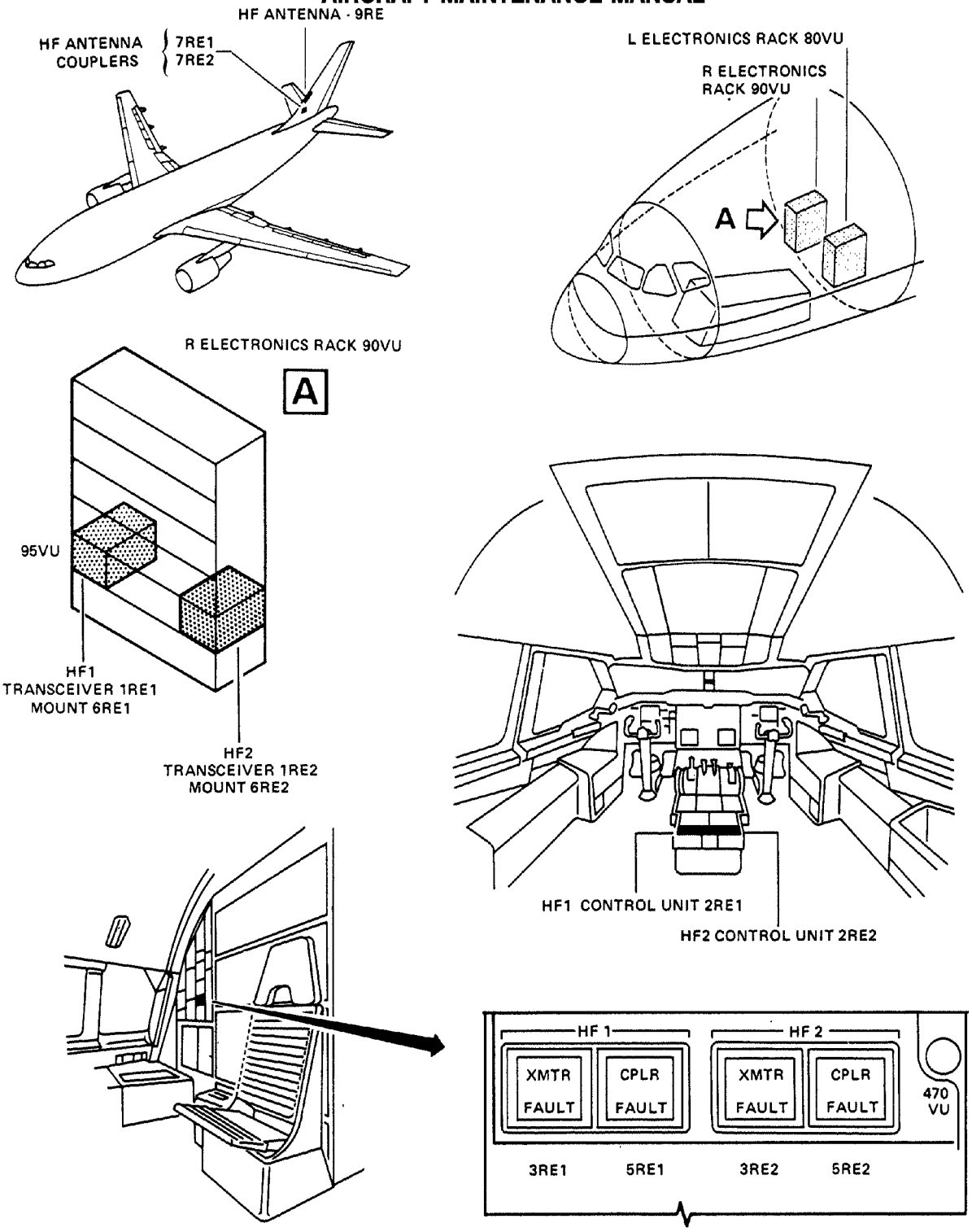
**ON A/C ALL

3. System Description

The HF system is made up of HF1 and HF2 installations which comprise :

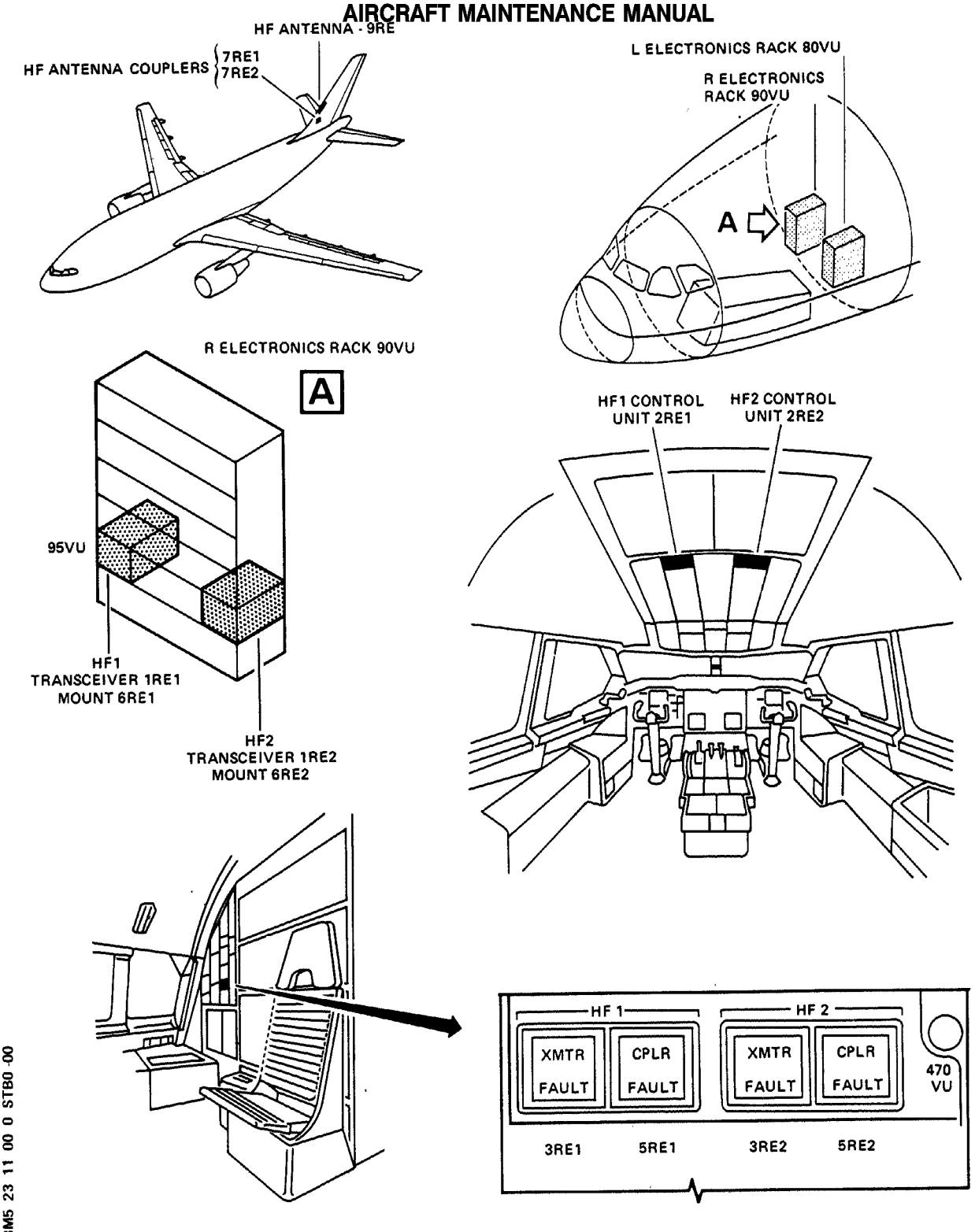
- two HF transceivers
- two HF control units
- two transmitter (XMTR FAULT) memorized fault annunciators
- two coupler (CPLR FAULT) memorized fault annunciators
- two antenna couplers
- an antenna contained in the vertical stabilizer leading edge.

Both systems are associated with the audio integrating and selective calling systems.




BM5 23 11 00 0 STA0 00

HF System - Component Location
Figure 001




HF System - Component Location
Figure 002

4. Electrical Power Supply
(Ref. Fig. 003)

A. HF1 System
The HF1 system is supplied with three-phase 115VAC, through 5A circuit breaker 4RE1 located on overhead panel 21VU from sub-busbar 304XP.
The transceiver provides the antenna COUPLER with 28VDC and 115VAC.
HF1 control unit 2RE1 is supplied with single-phase 115 V, from a phase of 5A circuit breaker 4RE1.
HF1 annunciators 3RE1 and 5RE1 are supplied with 28VDC by circuit WB.

B. HF2 System
The HF2 system is supplied with three-phase 115VAC through 5A circuit breaker 4RE2 located on overhead panel 21VU from sub-busbar 205XP.
The transceiver provides the antenna coupler with 28VDC and 115VAC.
HF2 control unit 2RE2 is supplied with single-phase 115 V from a phase of circuit breaker 4RE2.
HF2 annunciators 3RE2 and 5RE2 are supplied with 28VDC by circuit WB.

5. System Architecture

R **ON A/C 101-200,

(Ref. Fig. 004)

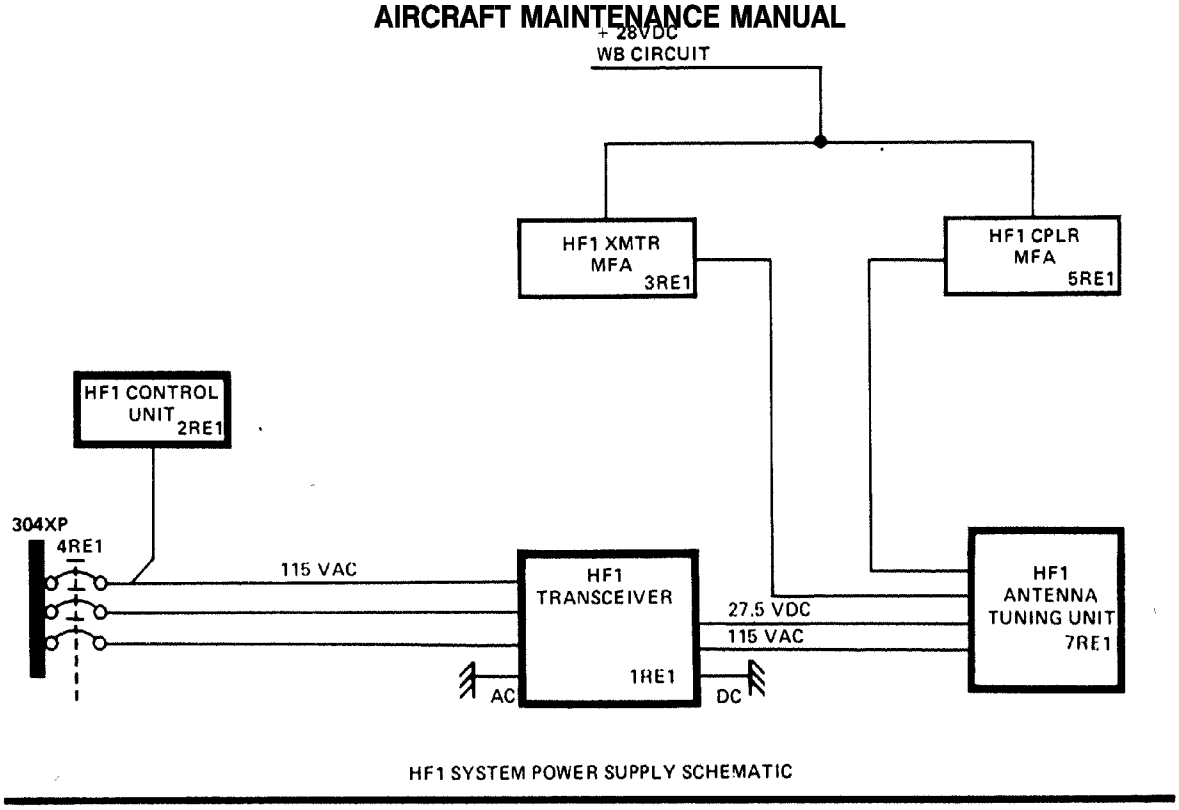
R **ON A/C 001-100,

(Ref. Fig. 005)

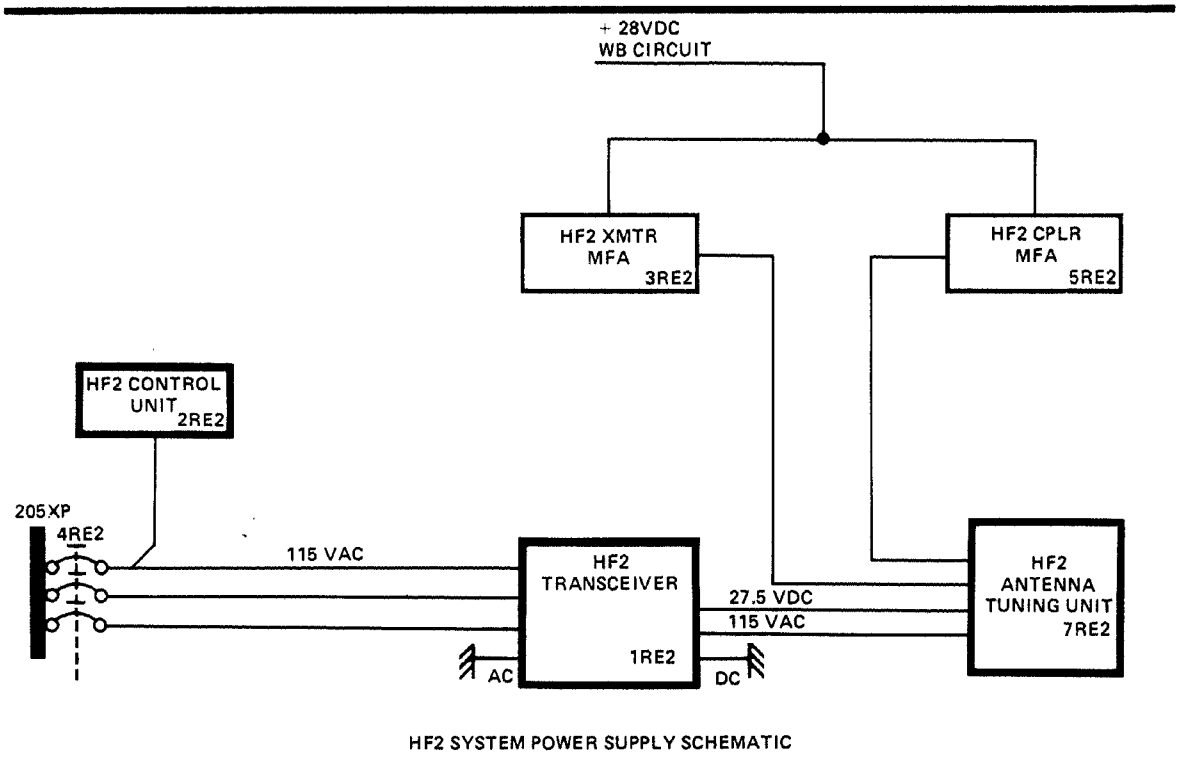
**ON A/C ALL

HF1 and HF2 systems are identical :
- the control unit enables selection of the operating frequency and mode
- the transceiver generates the operating frequency
  . the transmitter part transmits the modulated signals to the antenna through the antenna coupler.
  . the receiver part receives the signal from the antenna through the antenna coupler, demodulates and transmits it to :
    - the audio integrating system
    - the SELCAL (selective calling) system.

The HF transceiver is connected with the DFDAU (Digital Flight Data Acquisition Unit) to record the transmission sequences.
- the antenna coupler matches the transceiver output impedance to the antenna impedance in order to obtain maximum performance of the system. Both antenna couplers are interconnected so as to avoid simultaneous operation of both systems in transmit mode and protect the system which is in receive mode while the other is in transmit mode.
- the FAULT annunciators display faults of the transceiver or antenna



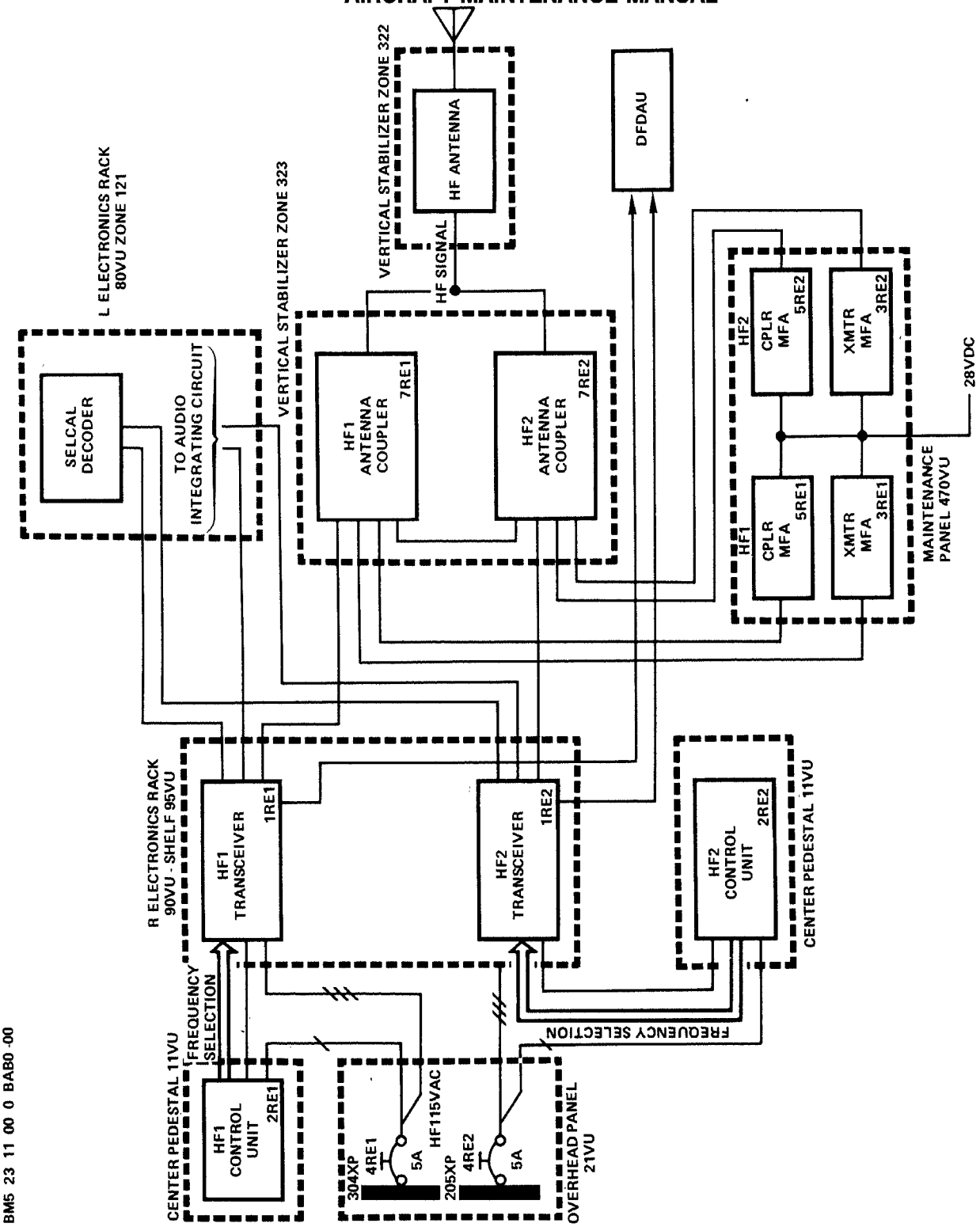

HF1 SYSTEM POWER SUPPLY SCHEMATIC



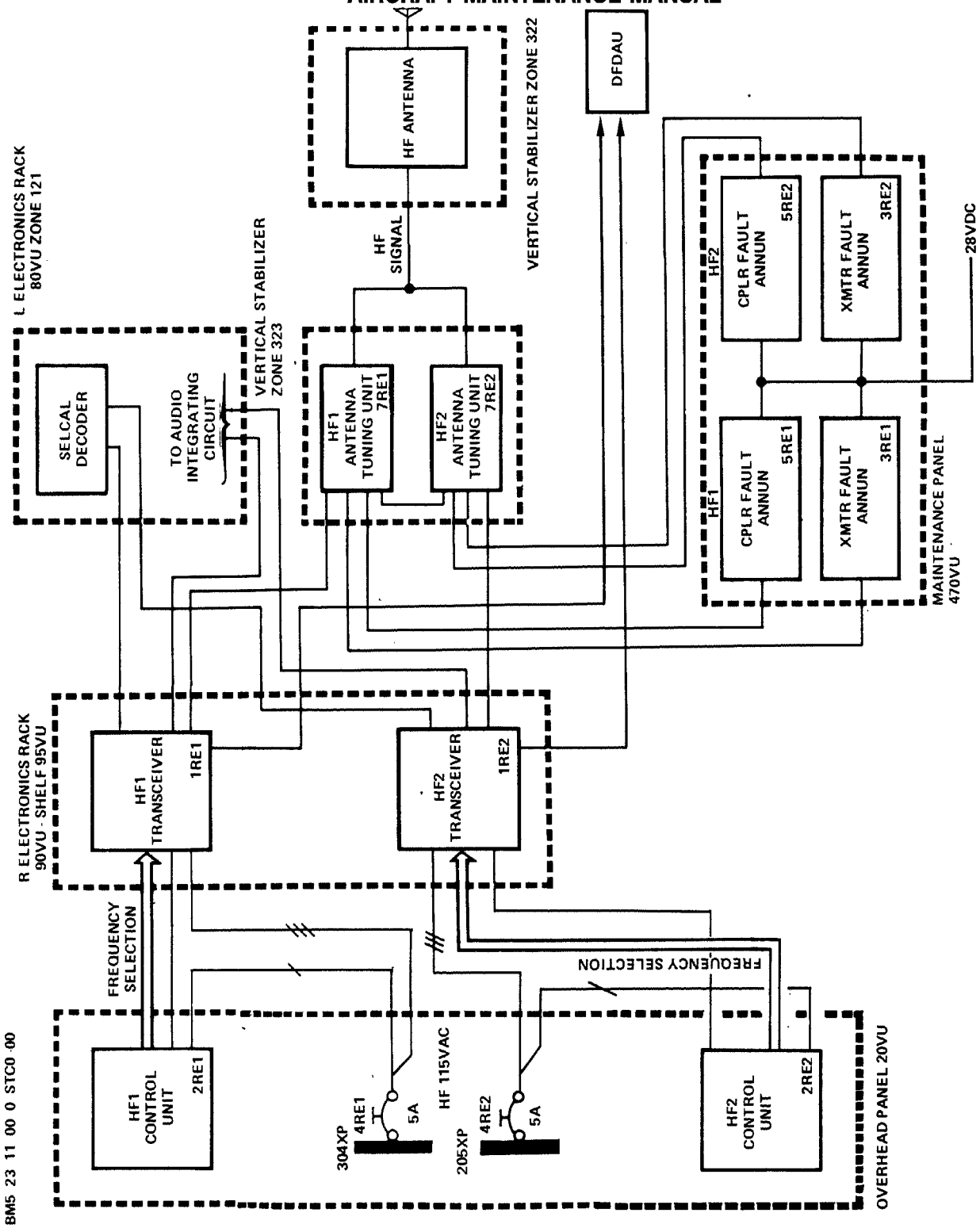

HF2 SYSTEM POWER SUPPLY SCHEMATIC

BM5 23 11 00 0 BAA0 00

HF System Power Supply - Schematic
Figure 003




HF System - Block Diagram
Figure 004




HF System - Block Diagram
Figure 005

coupler.

6. Interface
The HF system is connected with :
- the audio integrating system
- the SELCAL system
- the DFDAU (Digital Flight Data Acquisition Unit).

## 7. HF Transceiver

### A. Description

The communication transceiver conforms to ARINC Characteristic 719. Its case size is 6MCU, in compliance with ARINC 600 standards.

(1)HF transceiver face (Ref. Fig. 006)

The face features :

- two jacks (PHONE and MIC)
- a SQL/LAMP TEST illuminated pushbutton switch
- three red warning lights : LRU FAIL, KEY INTERLOCK, CONTROL INPUT FAIL
- a handle
- an identification plate.

(2)HF transceiver back

The back is equipped with three connectors to enable :

- connection with the automatic test circuits (top plug)
- connection with the antenna circuit and the peripheral circuits (middle plug)
- connection with the power supply circuits (bottom plug).

### B. Characteristics

The HF transceiver complies with the standards defined in ARINC 719 and 600. It enables transmission and reception of :

- voice radio communication messages through electroacoustic equipment (headset, hand microphone, boomset and loudspeaker)
- coded messages in keeping with ARINC 429.

The HF transceiver operates in the 2 to 29.9999 MHz frequency range (wide range) or in the 2.8 to 23.9999 MHz frequency range (narrow range) on channels spaced by 1 KHz or 100 Hz.

(1)Transmitter

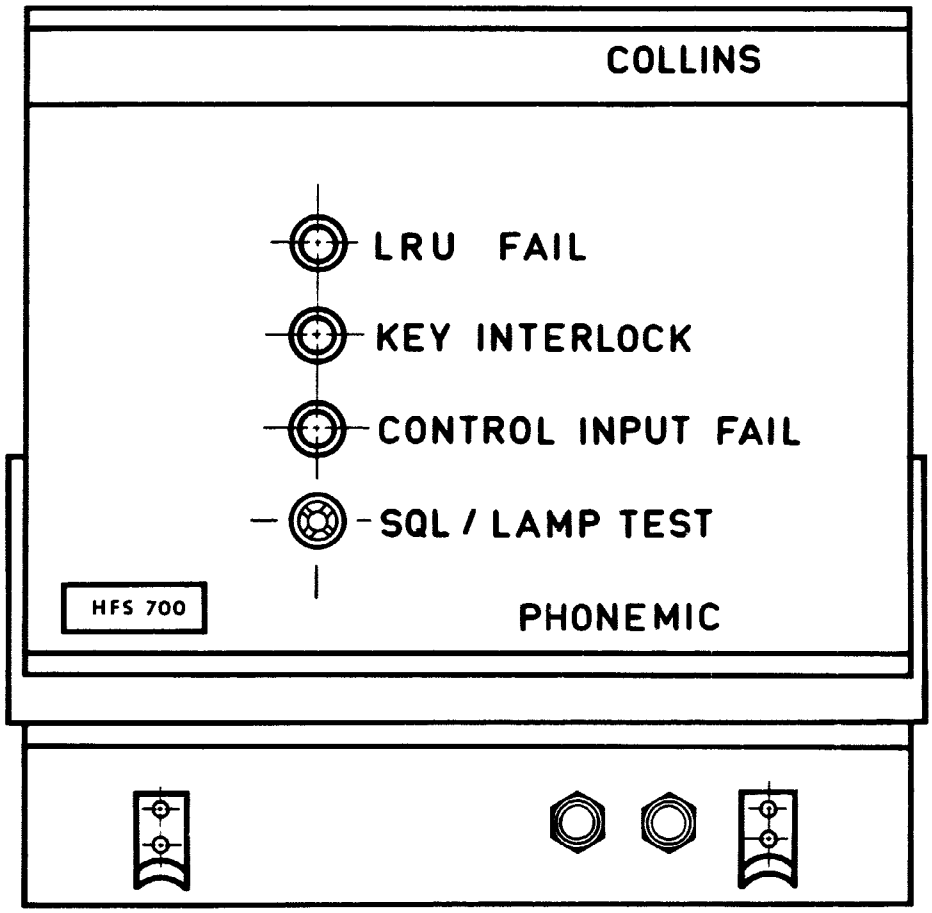
Output power : 125 W (average power)
400 W (peak-to-peak)
Antenna impedance : 50 ohms
Type of emission : AM (A3H), SSB (A3J-USB-LSB)
CW (A1), A9 (transmission data)
A7J (multichannel voice frequency telegraphy).

(2)Receiver

Output power : ≥5 mW into 600 ohms
Sensitivity : SSB : 1 µV for 10 dB (s+n)/n
AM : 4 µV for 10 dB (s+n)/n
Selectivity : SSB : -6 dB at +350 Hz to +2500 Hz
-60 dB at -1.5 KHz to +4.5 KHz
AM : -6 dB at ±2700 Hz
-60 dB at ±7000 Hz

(3)Power supply

Voltage : 3-phase, 115VAC, 400 Hz
Power : reception : 70 W (without blower)
transmission : 875 W (including 100-W blower)




BMS 23 11 00 0 AJM0

HF Transceiver
Figure 006

C. Operation

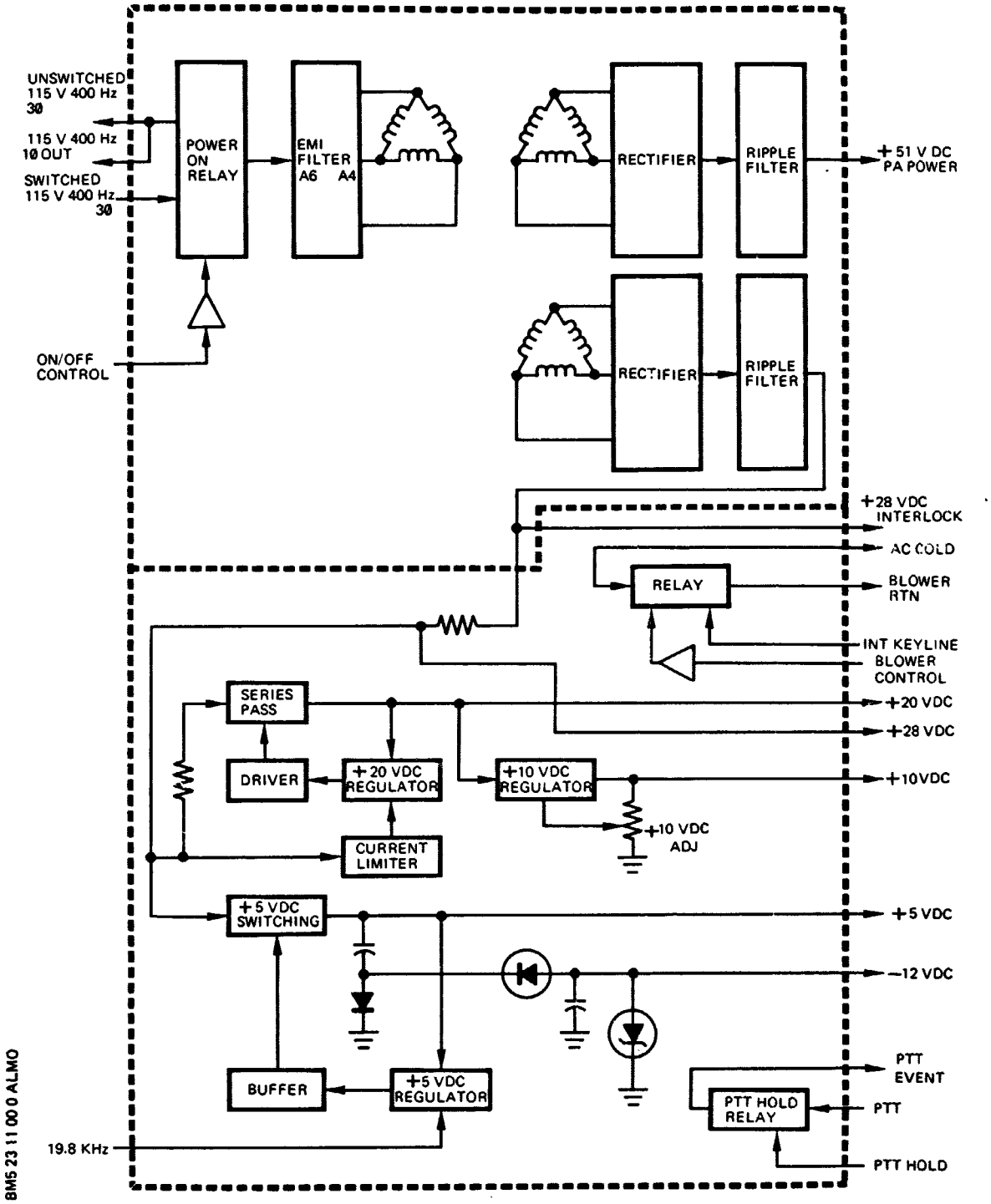
(1)Power supply (Ref. Fig. 007)

The HF transceiver is supplied with 115 V, 400 Hz, 3-phase power.
It is to be noted that one phase is used to supply with power the antenna coupler via the transceiver.
Filtered +51VDC is provided for the transmission power circuits. For the other circuits, four voltages are provided from the +28VDC source : +20 V +10 V, -12 V and +5 V.

(2)Block Diagram (Ref. Fig. 008)

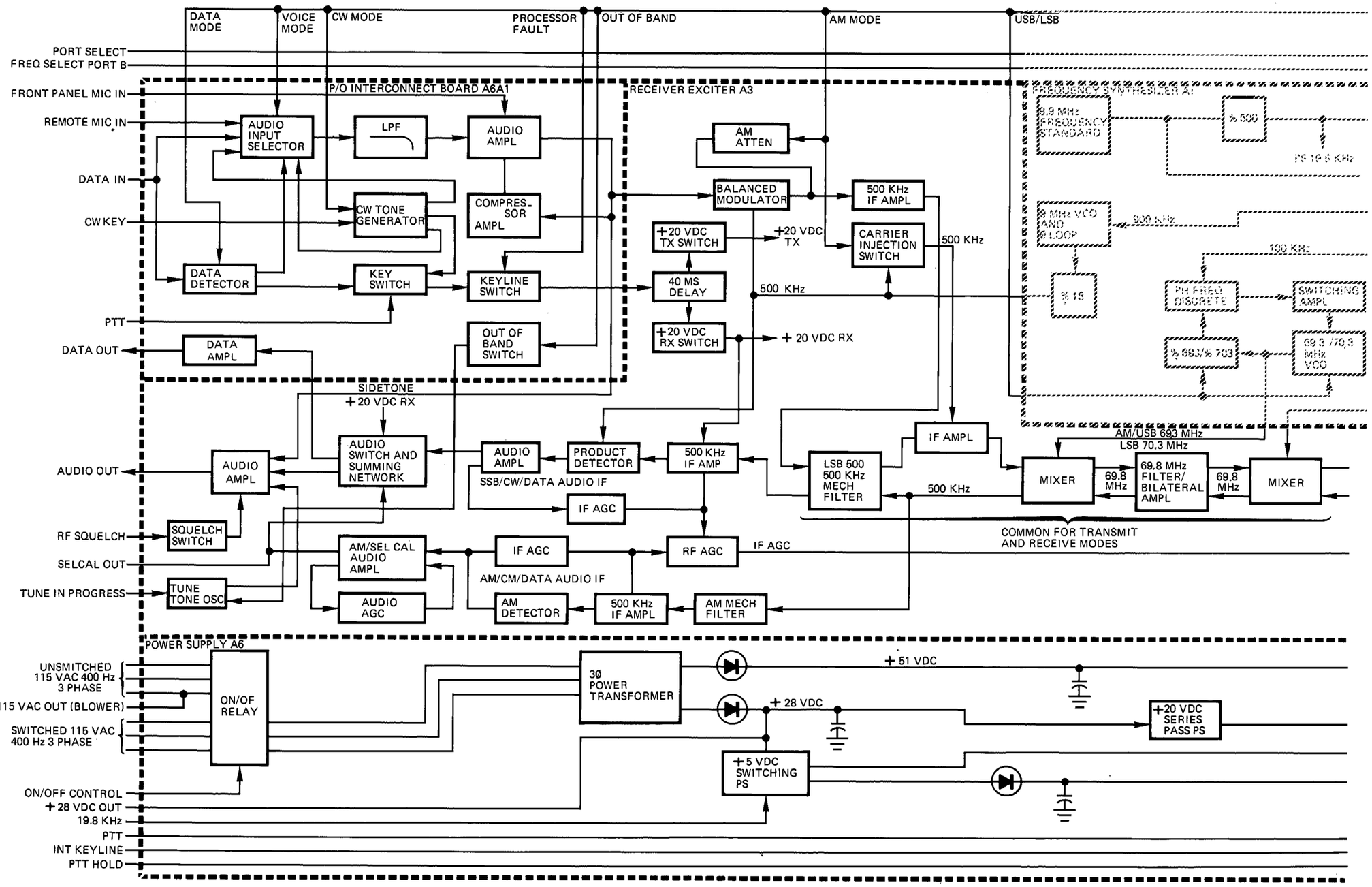
(3)Receiver (Ref. Fig. 009)

In receive mode, the antenna of the HF transceiver receives a signal of a frequency comprised between 2 and 29.9999 MHz. This signal is modulated in AM, USB or LSB mode.
The signal from the antenna coupler is sent to a bandpass filter through the antenna relay. This filter covers the frequency range between 2 and 30 MHz which obviates the need for tuned circuits.
The filter output is applied through a transformer to an attenuator controlled by the AGC circuit and by an RF sensitivity circuit.
The signal is then amplified in a wideband class A amplifier and sent to a first mixer.
This mixer which is common to the transmit and receive parts receives the signal from the antenna (frequency between 2 and 29.9999 MHz) and the 71.8 to 99.7999 MHz signal from the synthesizer.
When both signals are mixed, a 69.8 MHz signal is obtained.
This 69.8 MHz signal is sent, after filtering and amplification, to a second mixer (common to the transmitter and receiver).
This second mixer also receives a signal of 69.3 MHz in USB and AM operation or of 70.3 MHz in LSB operation. At the mixer output, a second intermediate frequency of 500 KHz is obtained.
This 500 KHz signal is processed in two different ways depending on the mode of operation, i.e. SSB or AM mode.



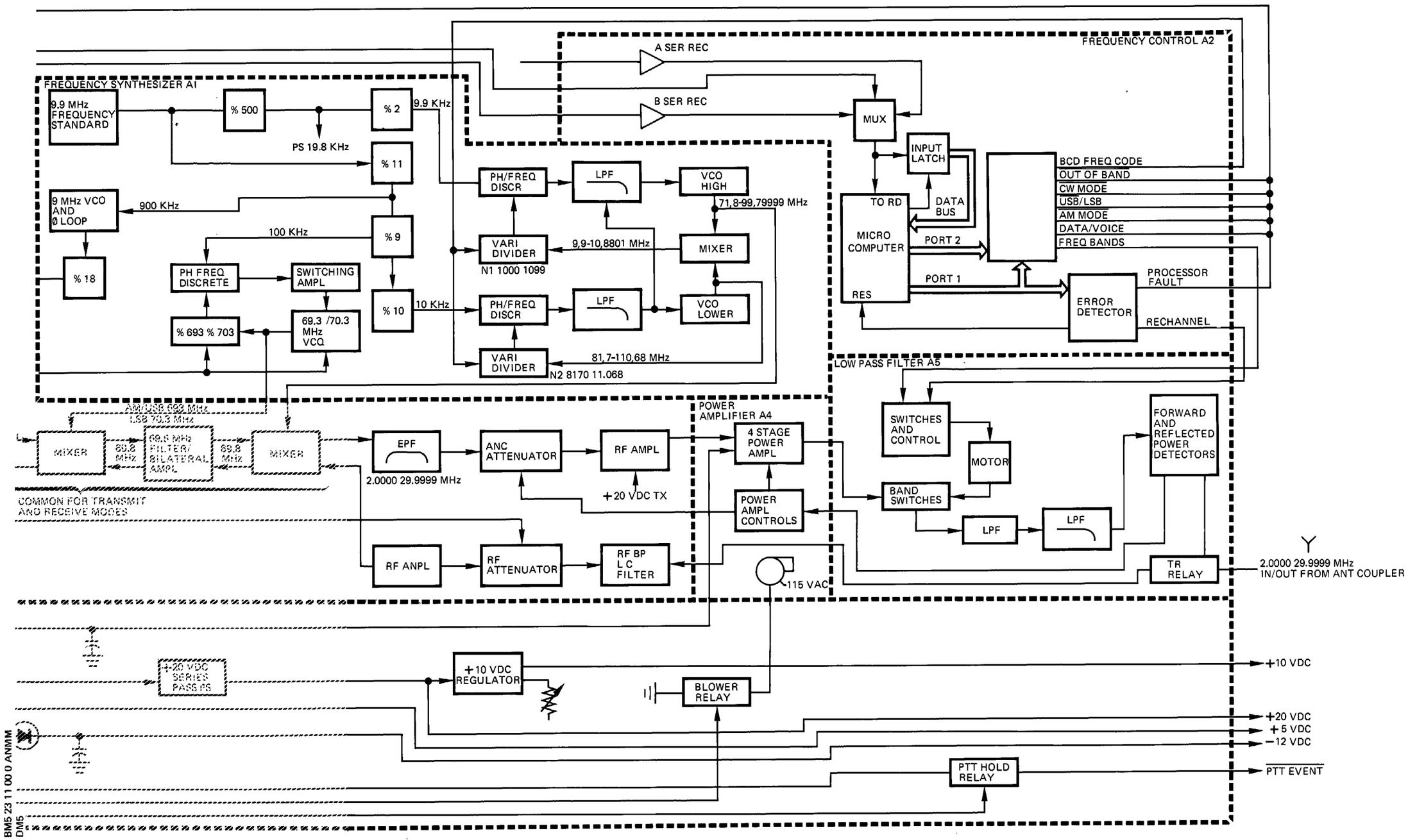

HF System - Power Supply
Figure 007

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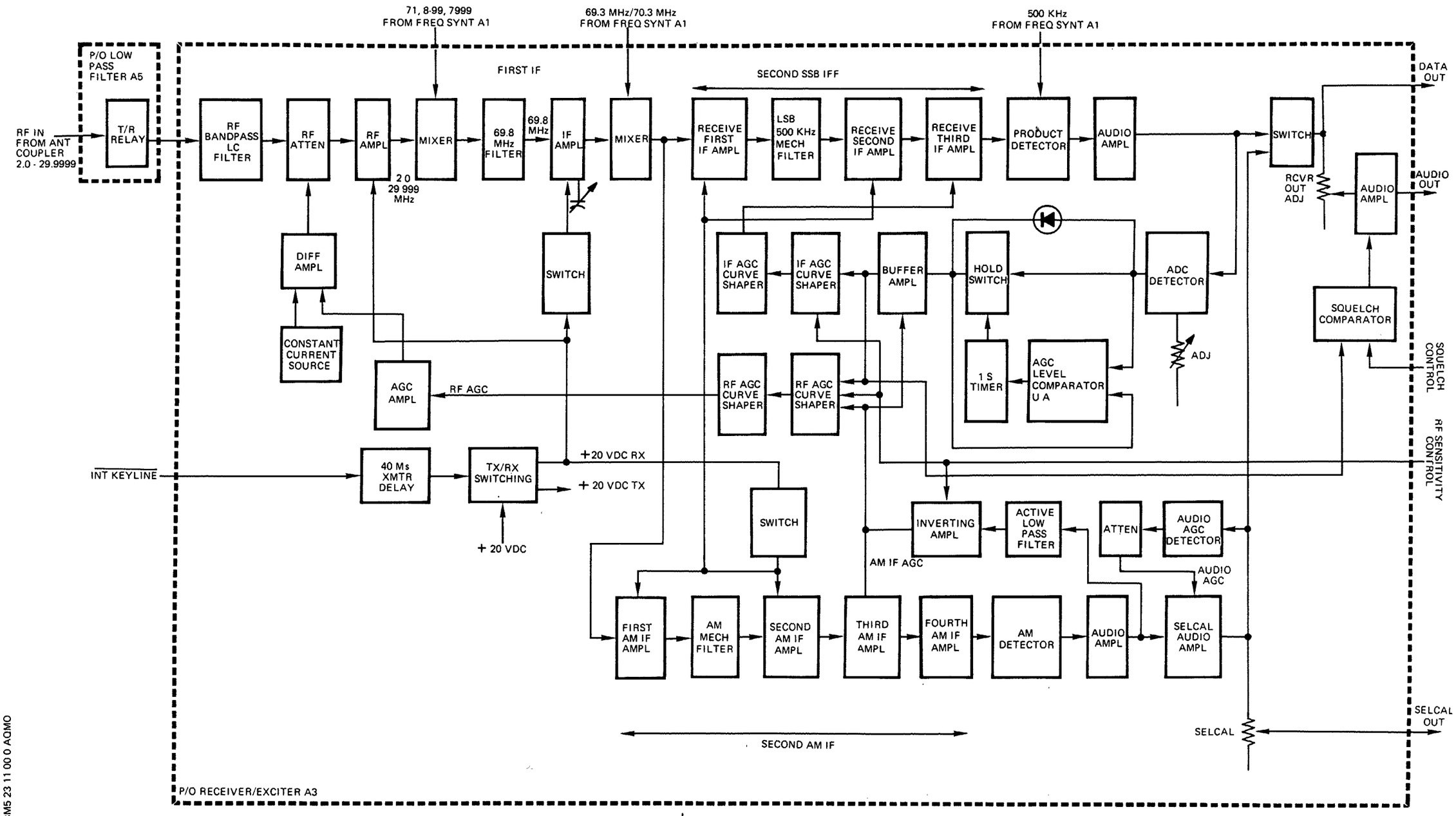



BM5 23 11 00 0 ANMA
DM5

HF Transceiver - Block Diagram Sheet 1/2
Figure 008




HF Transceiver - Block Diagram Sheet 2/2
Figure 008




BM5 23 11 00 0 AOMO

Functional Block Diagram
Figure 009

(a)SSB mode

Whatever 1. the signal received (USB or LSB) the 500 KHz signal obtained after previous frequency transpositions is always an LSB signal.

This signal is applied to the 500 KHz LSB filter, amplified and then applied to a product detector circuit. This circuit receives the LSB 500 KHz signal and a 500 KHz square wave from synthesizer. The output is the detected audio signal.

This signal is filtered, amplified and transmitted via the AGC circuit and an AF input circuit which receives the signals from the AM and SSB channel.

This circuit is used to power the data output (0.5 V) and the audio output through a final amplifier controlled by a squelch circuit.

(b)AGC circuits

In SSB mode, two different AGC circuits are used to check the gain of the receiver : an IF AGC and an RF AGC circuit.

The detected signal is applied to an AGC detection circuit which produces a DC output directly proportional to the detected voltage. This voltage is applied to an IF AGC curve shaper which regulates the third IF amplifier input.

In the event of a momentary interruption of the signal, the AGC hold circuit maintains the last DC voltage level for 1 s.

The AF AGC circuit is also controlled by the DC voltage coming from the AGC detection but acts on the receiver input circuits at the level of the attenuator.

(c)Squelch circuit

The squelch circuit is checked by the DC voltage coming from the AGC detection. This voltage is applied to a comparator circuit. The other input of the comparator is provided with a voltage dependent on the value of the control unit squelch potentiometer. Preponderance of one signal can disable the final audio circuit.

(d)AM mode

The 500 KHz signal from the second mixer is applied to a first amplifier. It is then filtered by a 6 KHz band pass mechanical filter centered on 500 KHz.

The signal is amplified three times by an amplifier controlled by the AGC circuit and then detected. It is amplified again and sent to two circuits : AGC circuit and AF circuit (SELCAL and AUDIO). The SELCAL output delivers a 0.5 V on a 600-ohm load.

At audio output, the signal is sent to the AF input circuit described above.

(e)AGC circuits

In AM/SELCAL mode, three different AGC circuits are used :

- AGC audio circuit :
  The AGC audio circuit acts upon the last stage of the SELCAL audio amplification depending on the detected AF output level.
- AGC intermediate frequency circuit :
  The AGC intermediate frequency circuit acts upon the third stage of the intermediate frequency amplifier and ensures regulation depending on the detected IF signal value.
- AGC HF circuit :
  The AGC HF circuit acts upon the HF stages (RF attenuator) depending on the detected IF signal.

(4)Transmitter (Ref. Fig. 010)

The modulation signal (audio, data or CW tone) is applied to a selection circuit, a low-pass filter and an amplifier. A signal compressor enables regulation of the input signal.

After amplification, the audio signal modulates, within a balanced modulator, a 500 KHz injection signal from the frequency synthesizer. The 500 KHz carrier is cancelled and only the two sidebands are present on either side of the 500 KHz at the modulator output.

This signal is amplified in a first 500 KHz amplifier before it is applied to a lower sideband (LSB) mechanical filter. This filter removes the upper sideband (USB). The signal is then amplified in a second 500 KHz amplifier before it is applied to a first mixer.

When transmitting in AM mode, the second 500 KHz amplifier receives a 500 KHz carrier signal from the synthesizer through a carrier injection circuit. The 500 KHz signal, with or without a carrier, is then mixed, in a first mixer stage, with a 69.3 MHz signal in USB mode and with a 70.3 MHz signal in LSB mode.

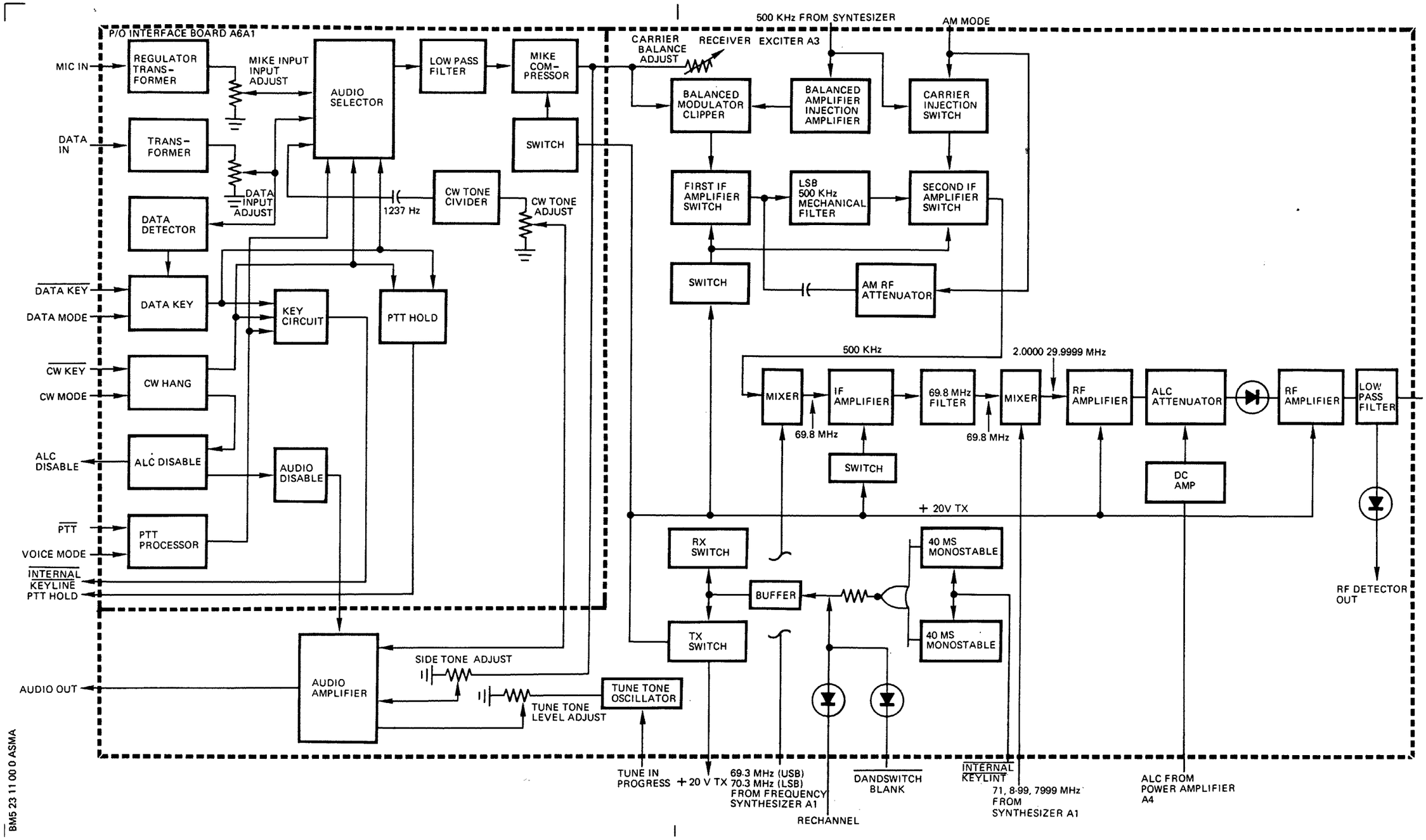
These signals from the frequency synthesizer mixed with the lower band 500 KHz produce a 69.8 MHz signal.

The 69.8 MHz signal is sent to a second mixer through a crystal filter. Within the second mixer, the 69.8 MHz signal is mixed with the 71.8-to-99.799 MHz frequency signal from the synthesizer. The resulting signal is a 2-to-29.9999 MHz signal.

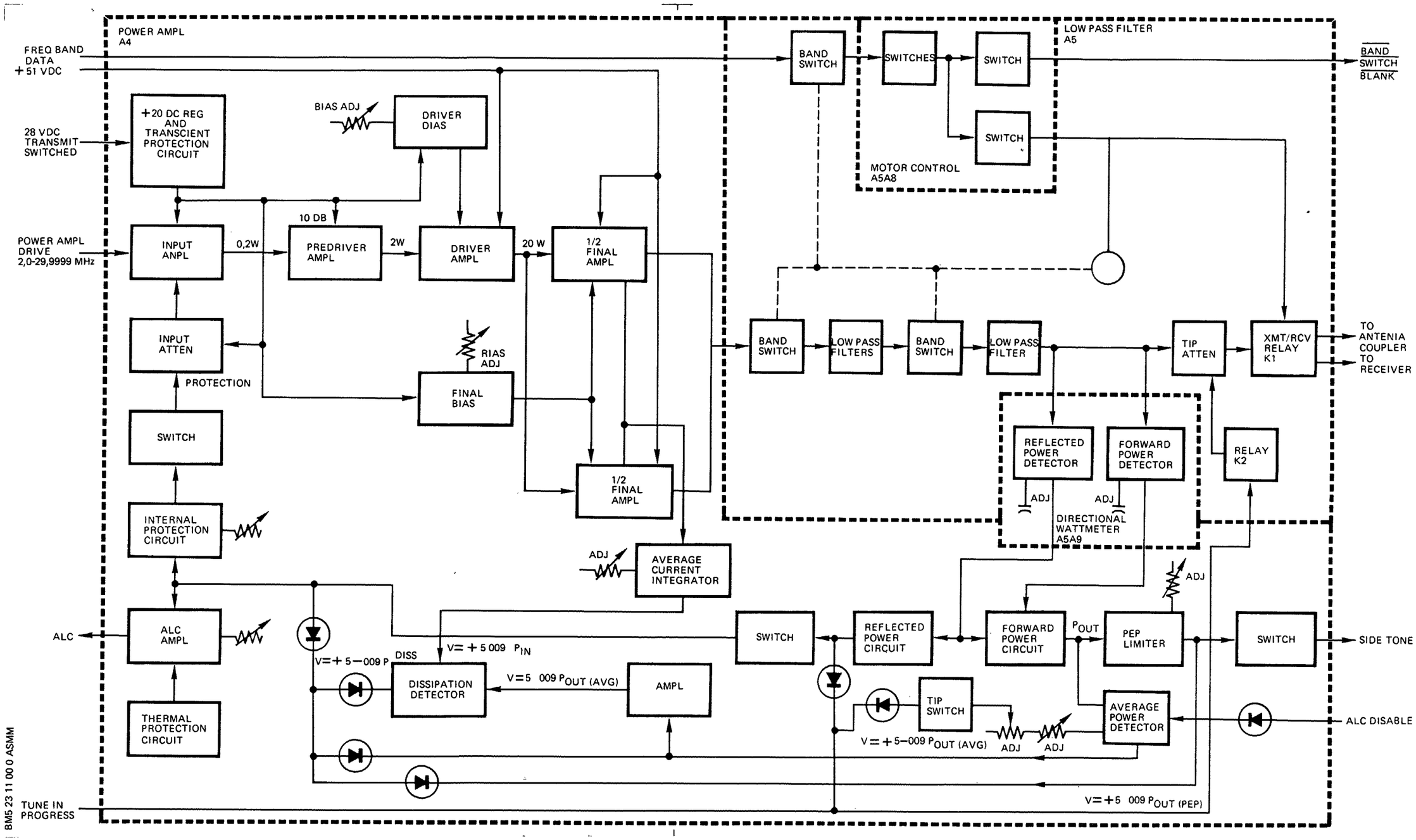
The output signal of the second mixer is amplified in three stages and then filtered. The signal output level is maintained constant through an automatic load control (ALC) attenuator.

This signal is then applied to a 4-stage power amplifier which raises the power to 400 W peak-to-peak. The power amplifier stage has protective circuits which provide instantaneous reduction of the output power in the event of component overload or overheating.

The signal is routed through seven filters which can be switched in by a motor, according to the operating frequency. These filters cover the frequency band from 2 to 29.999 MHz and cancel the harmonics of the output frequency. The signal is then sent to the antenna coupler and to the antenna through an antenna relay and internal directional wattmeter. Forward and reflected power measured by the wattmeter provides voltage which is used for modulation control, automatic load control (ALC) attenuator and power amplifier protection.




Transmitter - Sheet 1/2
Figure 010




Transmitter - Sheet 2/2
Figure 010

(5)Synthesizer (Ref. Fig. 011)

The frequency synthesizer provides the four following frequency sources :

- a fixed 500 KHz square wave signal
- an USB 69.3 MHz sine wave or an LSB 70.3 MHz sine wave signal
- a variable 71.8 to 99.7999 MHz sine wave signal
- a fixed 19.8 KHz square wave signal.

These signals are generated or derived from a 9.9 MHz frequency standard.

(a)500 KHz signal

The 500 KHz signal is derived from a 9 MHz crystal oscillator. It is then divided by 9 and by 2. A monitoring circuit compares the signal from the crystal oscillator with the signal from the frequency standard in order to obtain a great stability.

The 500 KHz signal is used in the balanced modulator and in the mixer detector used in SSB reception.

(b)69.3 MHz (USB) - 70.3 MHz (LSB) signals

These two signals are delivered by a 69.3 or 70.3 MHz voltage-controlled oscillator (VCO). The signal is divided by 693 or 703 and is compared with a 100 KHz signal delivered by the frequency standard (9.9 MHz divided by 11 and 9).

These frequencies are utilized in the mixer to produce an intermediate frequency of 69.8 MHz in transmission or a 500 KHz signal in reception.

(c)71.8 to 99.7999 MHz signal

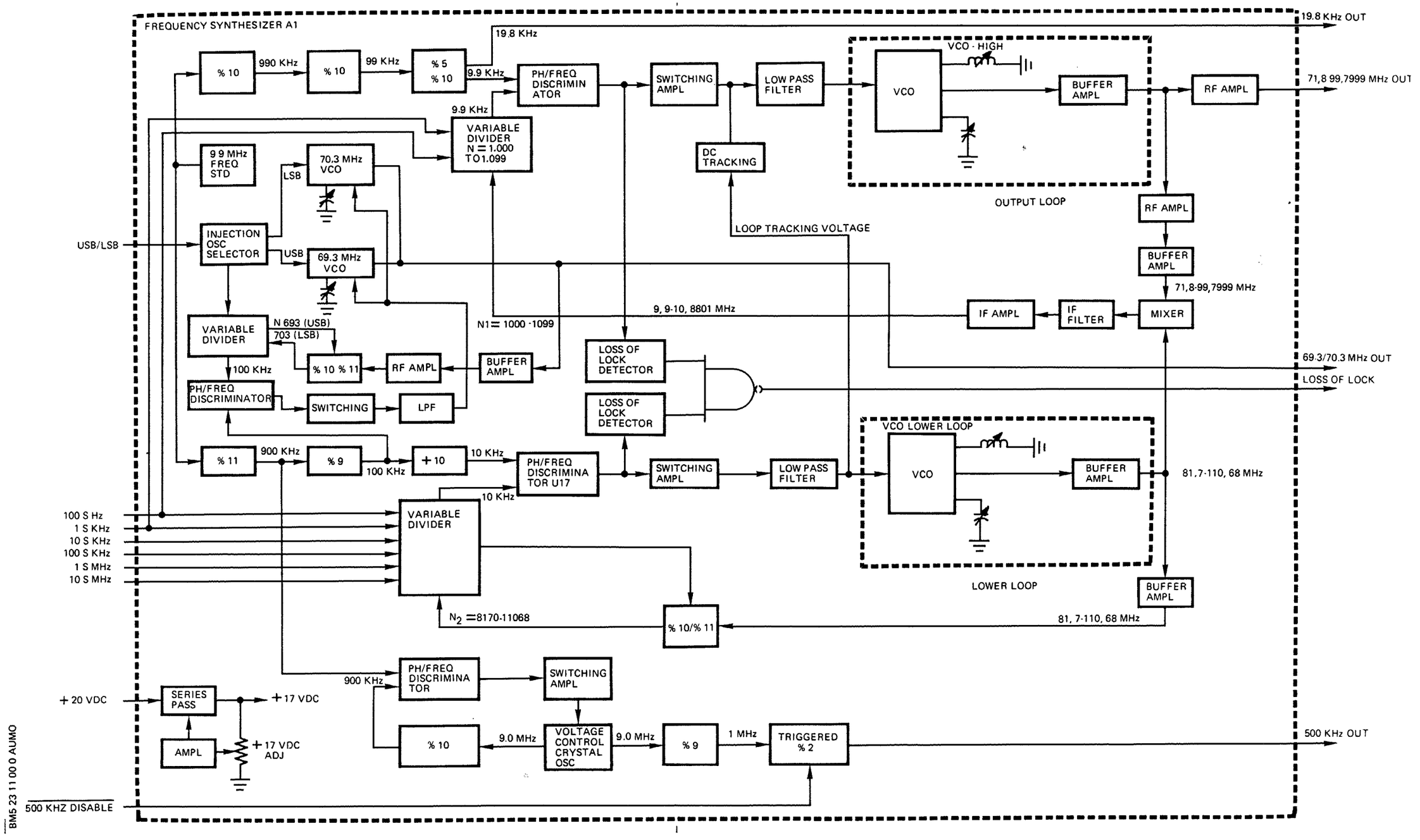
This signal which is used as a local oscillator is produced by two cross-checked phase-locked loops. With this system, the local oscillator loop output is mixed with the output signal of the other loop oscillator in order to ensure frequency accuracy.

These two loops utilize a reference signal of 9.9 KHz from the frequency standard and BCD data from the frequency controller.

(d)19.8 KHz signal

The 19.8 KHz signal is derived from the frequency standard 9.9 MHz. The 9.9 MHz frequency is divided twice by 10 and then by 5 (total division by 500). This is a square-wave voltage which is used in the power supply for the +5 V regulator and which, when divided by 2, delivers a 9.9 KHz frequency used as a reference by the preceding circuit.

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Frequency Synthesizer
Figure 011

(6)ARINC 429 message decoder selection (Ref. Fig. 012)
The various steps are controlled by the control unit and transmitted to the transmitter through a serial low-speed message in keeping with ARINC 429 characteristics.
The message can be made up of one or two words of 32 bits for the CW mode or for 100 Hz channel spacings.
Frequency and mode decoding within the word is carried out by a microprocessor.
The latter checks the message from the control unit and checks system operation. In the event of a failure, it controls the illumination of the lights located on the face and/or acts on the transmitter.

D. Test
Correct operation of the transceiver can be checked by means of the various lights located on its face.
- LRU FAIL warning light (LED)
  The LRU FAIL warning light comes on in the event of a transceiver failure such as : output power drop, microprocessor or synthesizer failure, etc.
- KEY INTERLOCK warning light (LED)
  The KEY INTERLOCK warning light comes on in the event of an antenna circuit failure such as : coupler failure, excessive tuning time, excessive antenna reactance, etc.
- CONTROL INPUT FAIL warning light (LED)
  The CONTROL INPUT FAIL warning light comes on when the serial message is faulty : absence of label, insufficient data repetition, message not valid.
- SQL/LAMP TEST pushbutton switch
  When pressing the SQL/LAMP TEST pushbutton switch, all the lights come on, the squelch is disabled and causes background noise to be heard in the headset.

8. HF Control Unit

A. Decription

R **ON A/C 101-200,

(Ref. Fig. 013)

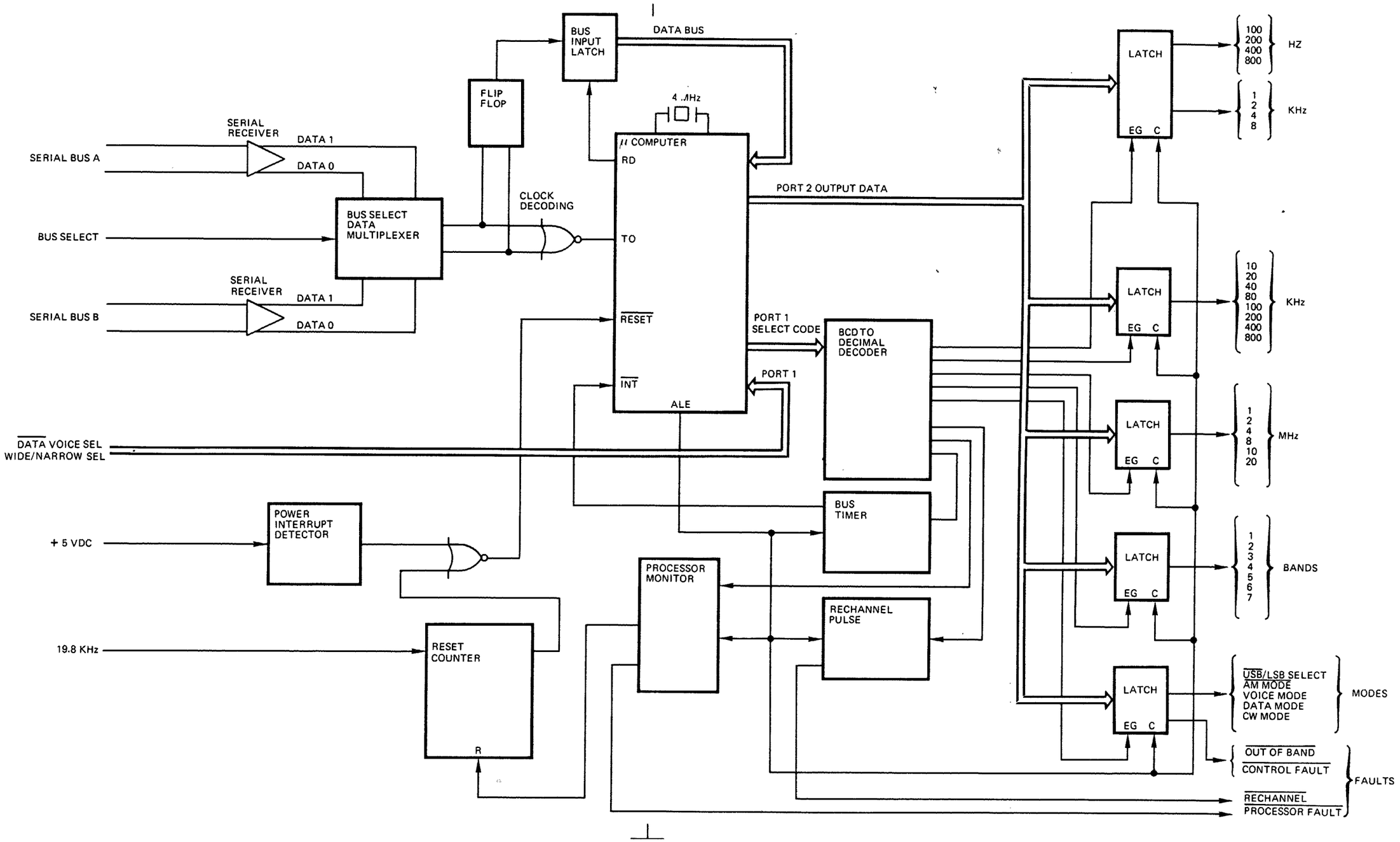
R **ON A/C 001-100,

(Ref. Fig. 014)

R **ON A/C ALL

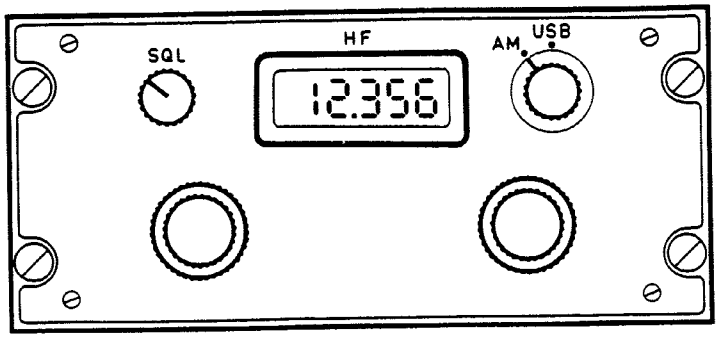
The HF Control Unit is a rectangular case in conformity with ARINC 719 specifications.
The face features :
- a frequency display (liquid crystal displays)
- two sets of two concentric knobs.

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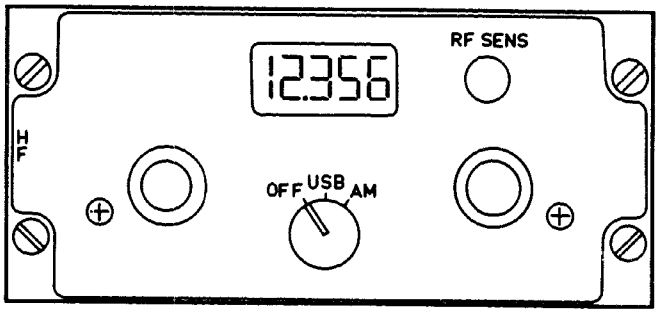

BM5 23 11 00 0 AWMO

Frequency Control - Functional Block Diagram
Figure 012




BM5 23 11 00 0 AKM2

HF Control Unit
Figure 013




BM5 23 11 00 0 AKR2 10

HF Control Unit
Figure 014

R **ON A/C 101-200,

- an AM/USB selector switch
- an squelch (SQL) adjustment potentiometer

R **ON A/C 001-100,

- an AM/USB/OFF selector switch
- a RF SENS adjustment potentiometer

R **ON A/C ALL

B. Characteristics

R **ON A/C 101-200,

- frequency range : 2.000 to 24.999 MHz
- channel spacing : 1 KHz
- signal output characteristics : ARINC 429
- power requirements : input power : 115V - 400 Hz
  current drain : 50 mA
  lighting voltage : 5V - 400 Hz
  lighting current : 1A maximum
- weight : 2.1 lbs

C. Utilization

R **ON A/C 001-100,

- frequency range : 2.000 to 29.999 MHz
- channel spacing : 1 KHz
- signal output characteristics : ARINC 429
- power requirements : electronic part : 1.1 W 115 VAC
  lighting part : 2.5 W 5 VAC
- weight : 1.8 lbs

C. Utilization

R **ON A/C ALL

The frequency is selected by rotating the four concentric knobs
On the left, the outer knob enables selection of tens and units of MHz.
The inner knob enables selection of tenths of MHz.
On the right, the outer knob enables selection of hundredths of MHz.
The inner knob enables selection of thousandths of MHz.

R **ON A/C 101-200,

AM and USB function selection is obtained by placing the selector switch

located on the right, in the position corresponding to the desired function. On the left, the SQL potentiometer adjusts the level at which the transceivers squelch device is activated, according to efficient signal and noise levels.

R **ON A/C 001-100,

OFF, AM and USB function selection is obtained by placing the selector switch located between the two sets of concentric knobs in the position corresponding to the desired function. On the right, the RF SENS potentiometer controls transceiver sensitivity in receive mode.

R **ON A/C ALL

D. Operation

R **ON A/C 101-200,

(Ref. Fig. 015)

R **ON A/C 001-100,

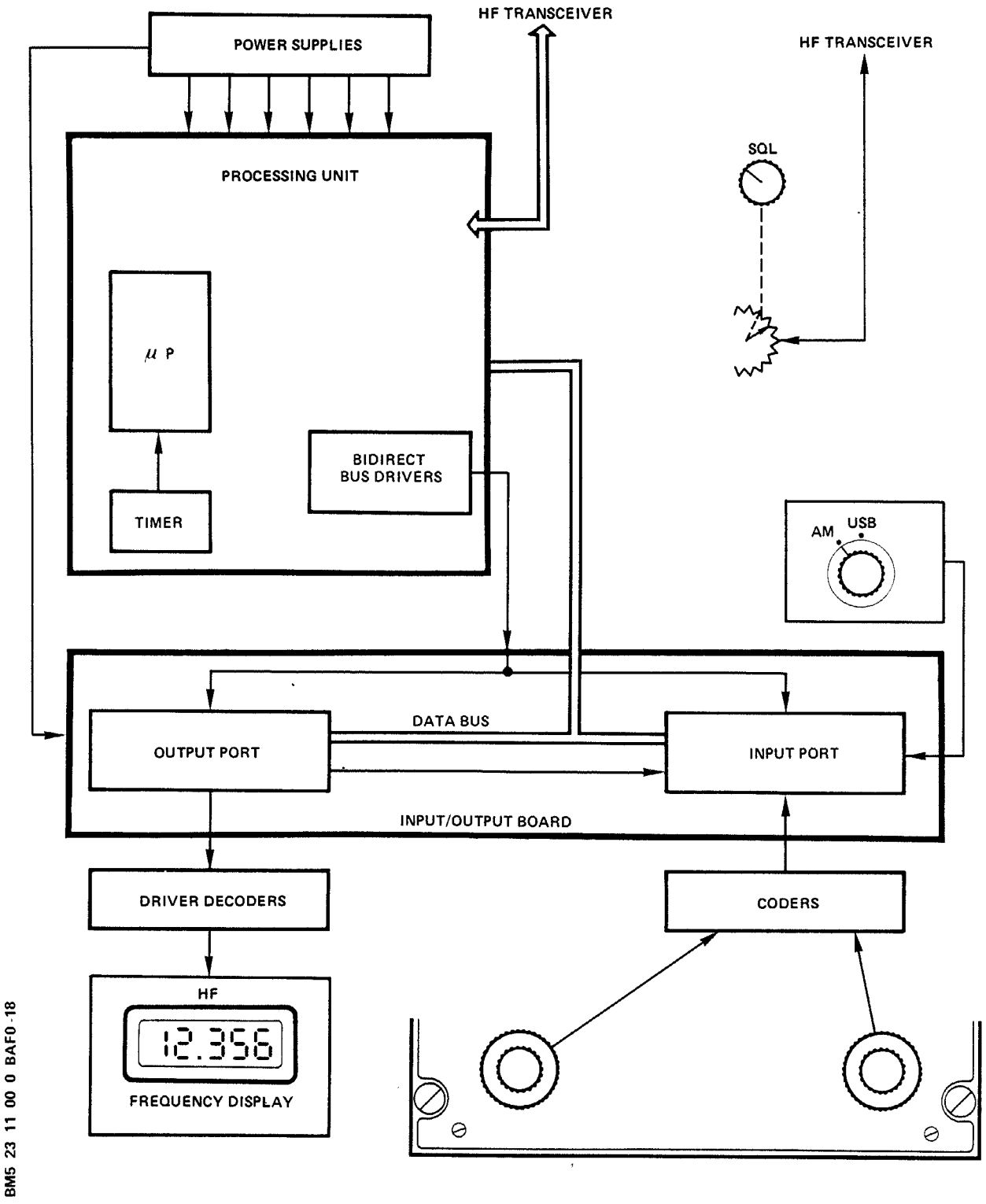
(Ref. Fig. 016)

R **ON A/C 101-200,

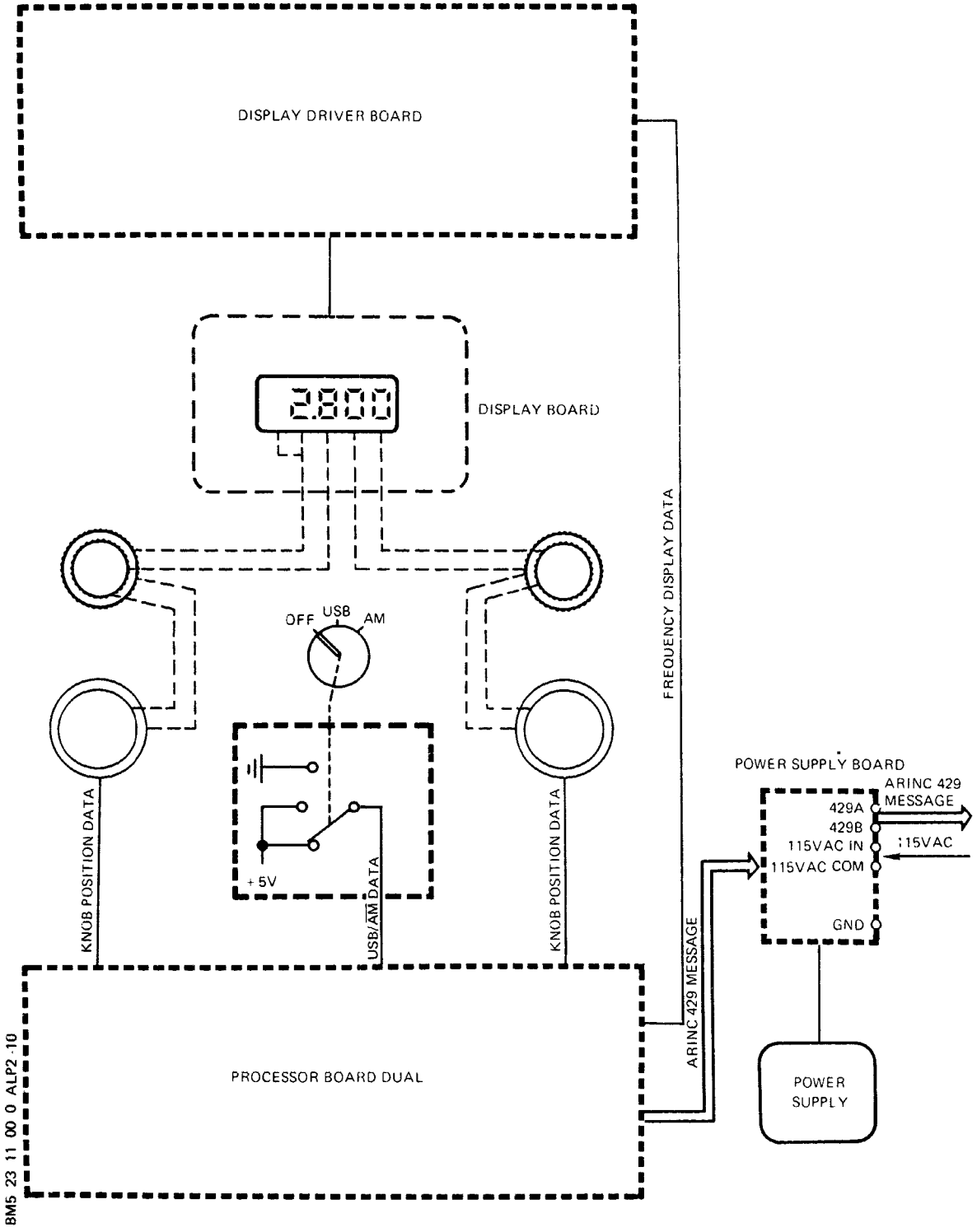
The frequency value data corresponding to the knob position data are sent to an input/output board through a coding device. This board ensures, through a data bus, transmission of voltage levels (0-5V) read on coders, to the processing unit board. The processing unit board equipped with a microprocessor processes the message transmitted by the input board and converts it into a 32-bit logic message consistent with ARINC 429 specification.
Data exchange between the microprocessor and the input/output board is ensured by a bidirectional bus driver. The input/output board transmits logic data from the microprocessor to the driver decoders which generate liquid crystal display control signals and voltages.

R **ON A/C 001-100,

The frequency data (knob position data) are sent to two inputs of the dual processor board by means of two coding devices.
The dual processor board delivers :
- frequency display data to the display driver board
- ARINC 429 output message to the power supply board.
The display driver board delivers the polarizing voltages required by the various segments of the liquid crystal displays to display the selected frequency values.
The ARINC 429 frequency display control message from the processor board is sent to the output connector through the power supply board.




HF Control Unit - Block Diagram
Figure 015




HF Control Unit - Block Diagram
Figure 016

R **ON A/C ALL

E. Display Test
The display test is performed by placing the **ANN LT** switch on the overhead panel (**436VU**) in **TEST** position.
All digits display **8**.
NOTE : **COLLINS HF** control panels (if fitted) do not display "eights".

## 9. HF Antenna Coupler

### A. Description

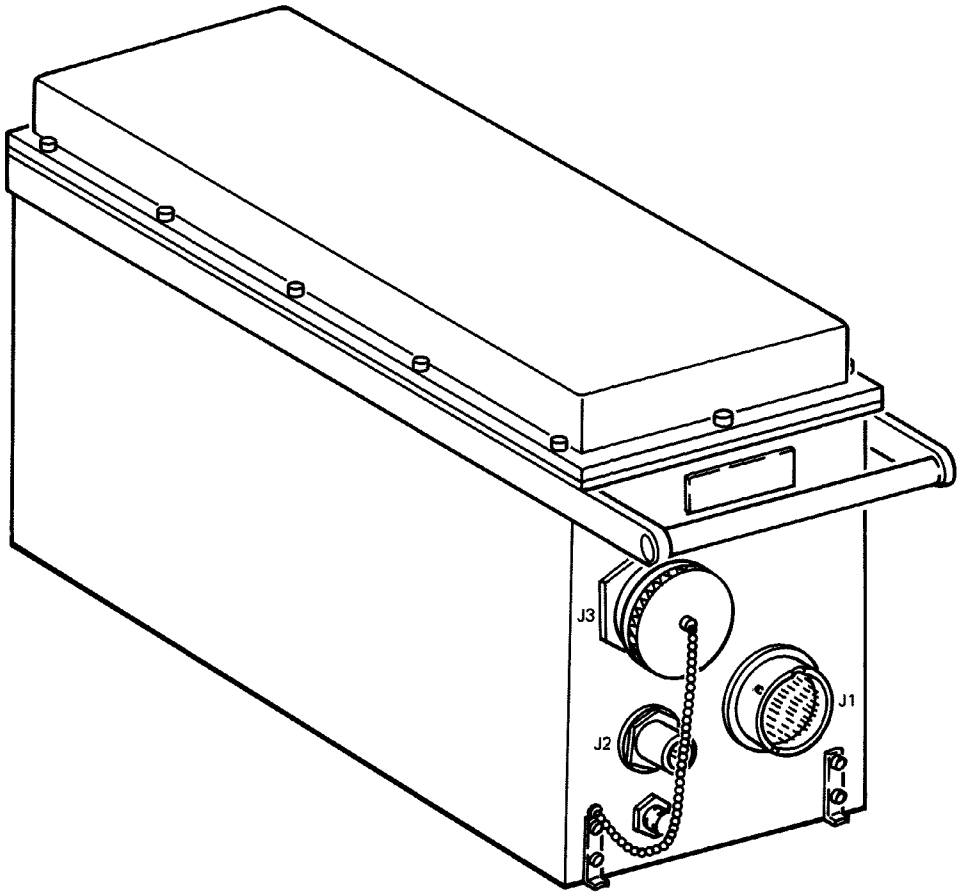
The HF antenna coupler enables matching of the aircraft HF antenna with the output circuit (50 ohms) of the HF transceiver.
The coupler is a pressurized sealed box.

(1) The face features : (Ref. Fig. 017)
- a connector J1 for connection with the transmitter
- a coaxial connector J2 to connect the coaxial cable from the transmitter
- a connector J3 for test equipment connection
- a pressurizing valve
- a fault warning light
- a handle
- an identification plate

(2) The back carries :
- a connector providing connection between the coupler and the antenna.

### B. Characteristics

- power supply : 107.5 to 119.5 VAC
  380 to 420 Hz
- accepted power : average 400W or peak-to-peak 1000 W
- types of transmission : AM-SSB-CW
- tuning time : 2 to 4 s
- input impedance : 50 ohms
- weight : 7.7 kg




BM5 23 11 00 0 ANM2

HF Antenna Coupler
Figure 017

C. Operation (Ref. Fig. 018, 019)

The coupler is tuned in six sequences : start, reception/standby, tune A, tune B, tune C and operational position.

These six sequences are controlled by a sequence counter which starts the next sequence only when all the conditions related to the previous one are met. If a failure is detected during the tuning phase, tuning is stopped.

The tuning phase is initiated at HF system energization or when a new frequency is selected. The tune control line is then grounded and the tuning elements are placed in start position by means of servomotors controlled by servo-amplifiers.

(1)Start sequence

In this sequence capacitors C2, C3 and inductor L2 are positioned so that they present minimum impedance to signals. In addition, inductor L2 is disconnected from the circuit by means of switch S4. When all these conditions have been met, a pulse is applied to the sequence counter and the system is forced to the reception/standby phase.

(2)Reception/standby sequence

In this position, the coupler is in reception condition and ready for a tuning cycle.

PTT control grounding causes interlocking of couplers (case of dual system). A pulse is applied to the sequence counter and the system is forced to the next tuning sequence : tune A.

(3)Tune A sequence

The purpose of tune A is to adjust the antenna circuits so that HF signal current and voltage are in phase.

To this end after detection a discriminator delivers an error signal proportional to the phase difference during 50 ms. The polarity of this signal determines the elements required to achieve tuning.

Two cases may arise :

(a)Positive error signal

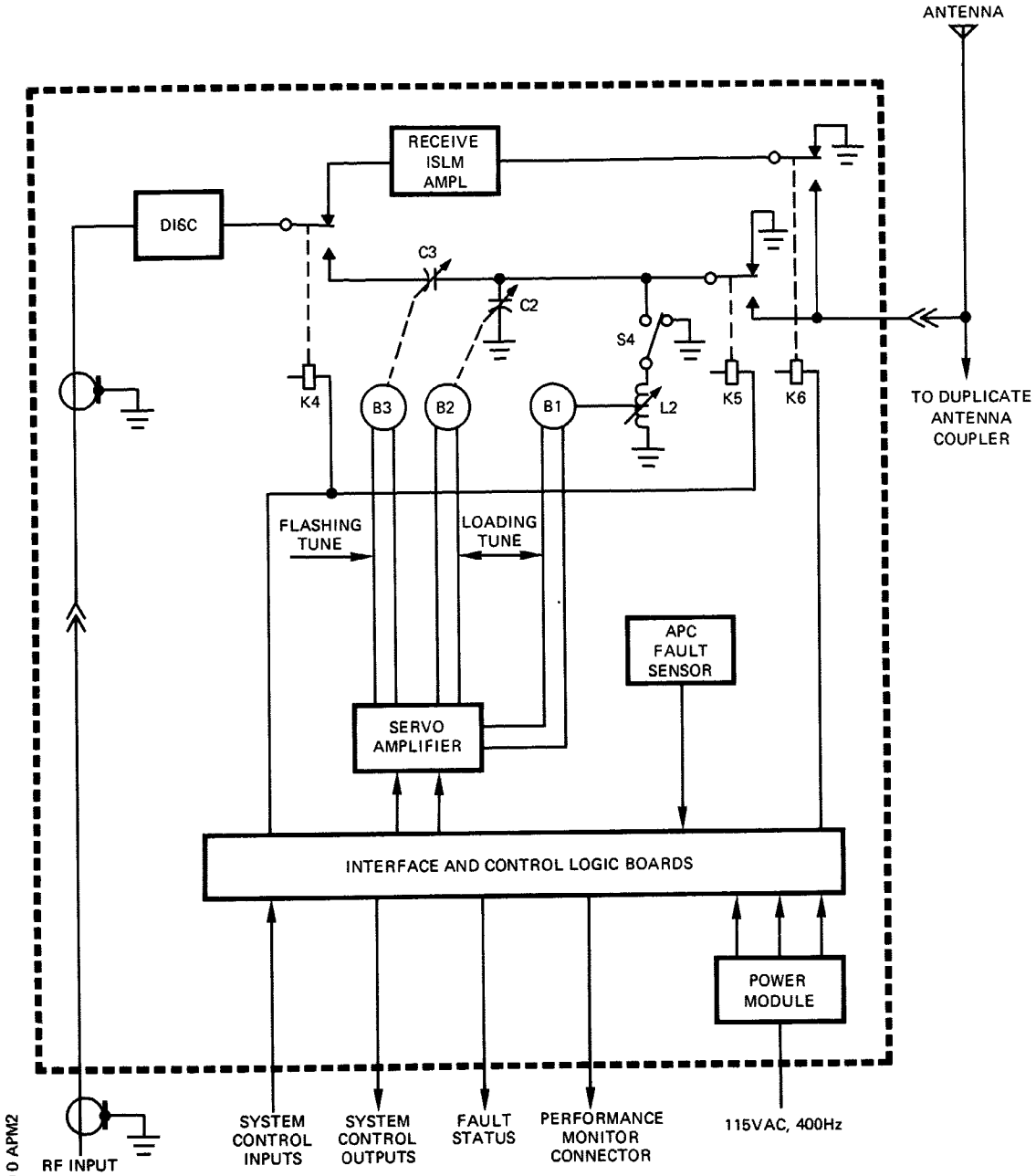
The antenna circuit impedance is inductive and is below the parallel resonance. The error signal is brought to zero by acting on capacitor C3.

(b)Negative or null error voltage

Two cases may arise :

- the antenna circuit impedance is above the parallel resonance (high band).
  The error signal is brought to a positive value through variation of inductance L2 and brought to a null value by capacitor C3.
- the antenna circuit impedance is below the parallel resonance (low band).
  The error signal is brought to a positive value through variation of capacitor C2 and then to a null value by capacitor C3.

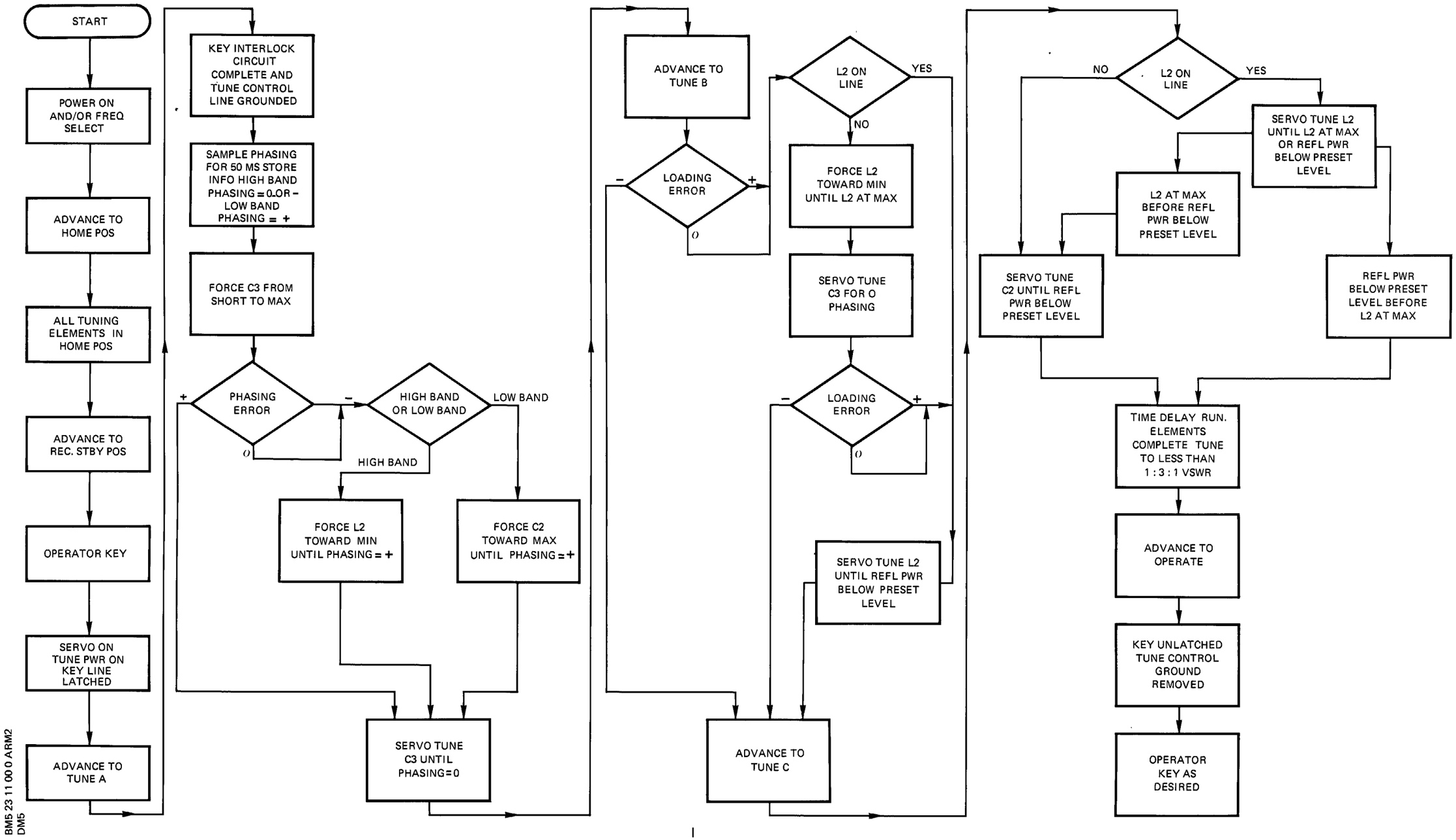
When the phase error signal is brought to a null value, the sequence counter controls change to the next sequence : tune B.




NOTE : POSITION INFORMATION IS PROVIDED FROM EACH TUNING ELEMENT TO CONTROL LOGIC

Functional Block Diagram
Figure 018

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START
POWER ON AND/OR FREQ SELECT
ADVANCE TO HOME POS
ALL TUNING ELEMENTS IN HOME POS
ADVANCE TO REC. STBY POS
OPERATOR KEY
SERVO ON TUNE PWR ON KEY LINE LATCHED
ADVANCE TO TUNE A
KEY INTERLOCK CIRCUIT COMPLETE AND TUNE CONTROL LINE GROUNDED
SAMPLE PHASING FOR 50 MS STORE INFO HIGH BAND PHASING = 0 OR – LOW BAND PHASING = +
FORCE C3 FROM SHORT TO MAX
PHASING ERROR
+
–
0
HIGH BAND OR LOW BAND
HIGH BAND
LOW BAND
FORCE L2 TOWARD MIN UNTIL PHASING = +
FORCE C2 TOWARD MAX UNTIL PHASING = +
SERVO TUNE C3 UNTIL PHASING = 0
ADVANCE TO TUNE B
LOADING ERROR
L2 ON LINE
YES
NO
FORCE L2 TOWARD MIN UNTIL L2 AT MAX
SERVO TUNE C3 FOR 0 PHASING
SERVO TUNE L2 UNTIL REFL PWR BELOW PRESET LEVEL
ADVANCE TO TUNE C
NO
L2 ON LINE
YES
SERVO TUNE L2 UNTIL L2 AT MAX OR REFL PWR BELOW PRESET LEVEL
L2 AT MAX BEFORE REFL PWR BELOW PRESET LEVEL
SERVO TUNE C2 UNTIL REFL PWR BELOW PRESET LEVEL
REFL PWR BELOW PRESET LEVEL BEFORE L2 AT MAX
TIME DELAY RUN. ELEMENTS COMPLETE TUNE TO LESS THAN 1 : 3 : 1 VSWR
ADVANCE TO OPERATE
KEY UNLATCHED TUNE CONTROL GROUND REMOVED
OPERATOR KEY AS DESIRED
BM5 23 11 00 0 ARM2
DM5

HF System - Flow Diagram
Figure 019

(4)Tune B sequence
The purpose of tune B is to match the antenna load with the transmitter output circuits.
To this end, a load discriminator compares the HF current and voltage. This comparison gives an error voltage proportional to the difference between the HF circuit impedance and an impedance of 50 ohms.
Two cases may arise :
(a)Load lower than 50 ohms (negative). it is not necessary to modify the tuning circuits, the sequence counter circuit controls change to the next sequence, i.e. tune C.
(b)Load greater than or equal to 50 ohms (positive)
Two cases may arise :
- inductor L2 is used in the tune A sequence. This inductance is re-used to decrease the reflected power below a determined level.
- inductor L2 is not re-used to achieve tune A sequence.
It is brought to its maximum inductance. As this tuning modifies phase tuning, capacitor C3 must be re-adjusted. When the phase error voltage is null, if the load, error voltage is null or negative (Ref. para. (2)) the following sequence starts, otherwise inductor L2 is adjusted to decrease reflected power to a preset level.
When the load error voltage is set to zero or if reflected power is decreased, the sequence counter starts the next sequence, i.e. tune C.

(5)Tune C sequence
The purpose of the tune C is to complete previous adjustments and obtain a VSWR lower than 1.3.
In this sequence capacitor C3 is adjusted to maintain voltage-current phase shift to zero. Capacitor C2 and/or inductor L2 are tuned to bring reflected power below a preset level.
If inductor L2 has not been used in tune A and B, capacitor C2 is adjusted until the reflected power valve decreases below a preset level corresponding to a VSWR lower than 1.3.
If inductor L2 has been used in tune A or B it is adjusted again so that VSWR goes below a preset level.
If adjustment is impossible and if inductor L2 is at maximum inductance, capacitor C2 is tuned again.
L2 is adjusted again until VSWR is lower than 1.3.
When a VSWR lower than 1.3 is obtained, the sequence counter controls start of the next sequence, i.e. operational position.

(6)Operational position
In this sequence, the tuning control line is disconnected from ground. The antenna coupler can operate. If a new frequency is selected, the antenna coupler goes back to the start sequence and the tuning cycle starts again.

1. Operational Test

A. Reason for the Job
(1)Read HF/CPLR FAULT and HF/XMTR FAULT MFA on lateral panel.
(2)To check transmission and reception from any crew member's station.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.

(1)Job set-up

NOTE 1 : The aircraft must be outside hangar.

NOTE 2 : The following adjustment/test procedure will be performed at any crew member's station.

- Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
- Make certain that electronics racks ventilation is correct.
- Close overhead panel circuit breakers, particularly those associated with RADIO-NAV & COM systems.
- On panel 132VU, make certain that LIGHTING/INT LT/ & EMER LT/and MAINT PANEL circuit breakers are closed.
- Place PTT switches in intermediate position at all crew member's stations.
- Place function selector switch on HF1 and HF2 control units 2RE1 and
R 2RE2 in AM or SSB position
- Connect boomset to each crew member's jack panel.

(2)Test

(a)HF/CPLR FAULT and HF/XMTR FAULT MFA.

NOTE 1 : Before carrying out test, record MFA's reading by placing TEST/READ/OFF switch 2WB located on panel 472VU in READ position ; if anyone comes on, take appropriate corrective action.

NOTE 2 : This test is to be performed 3 times so as to test the 3 MFA RESET pushbutton switches located on panels 470VU, 471VU and 472VU.

| ACTION | RESULT |
|---|---|
| 1. On panel 472VU<br>- Place ANN LT switch in READ position | On maintenance panel :<br>- Memorized fault annunciators HF/CPLR FAULT and HF/XMTR FAULT remain off. If one comes on, take appropriate corrective action. |

| ACTION | RESULT |
|---|---|
| 2. On panel 470VU (471VU) (472VU)<br>- press MFA RESET pushbutton switch | - all memorized fault annunciators go off. |
| NOTE : Some memorized fault annunciators may come on again, indicating the status of the system. | |
| 3. On panel 472VU<br>- Place ANN LT switch in OFF position | - all memorized fault annunciators go off, without exception. |

(b)Transmission and reception of HF1 or HF2 system

NOTE : The following adjustment/test procedures are for HF1 system. Procedures for HF2 system are identical, the electrical identifiers being shown in parentheses.

| ACTION | RESULT |
|---|---|
| 1. On audio control panel of selected station<br>- disengage HF1 (HF2) reception push-button adjust reception level<br>- engage HF1 (HF2) transmission key. | |
| 2. On HF1 (HF2) control unit<br>- select transmitting frequency of a station in operation. | |
| 3. At selected crew member's station<br>- hold then release INT/RAD PTT switch in RAD position | - during tuning period (approx. 8 s.) a 1000 Hz signal is received at boomset. |

R **ON A/C 101-200,

4. Not applicable

R **ON A/C 001-100,

| | |
|---|---|
| 4. On HF1 (HF2) control unit<br>- turn RF SENS potentiometer clockwise | - Make certain that squelch function is inhibited (a permanent background noise can be heard). |

R **ON A/C ALL

| | |
|---|---|
| 5. On audio control panel of selected station | - Action of potentiometer on reception level must be progressive |

| ACTION | RESULT |
|---|---|
| - turn HF1 (HF2) reception knob clockwise | and without any crackling. |
| CAUTION : BEFORE TRANSMITTING, MAKE CERTAIN THAT THE SELECTED FREQUENCY IS FREE AND OBSERVE RADIO REGULATIONS. | |
| 6. On HF1 (HF2) control unit,<br>- select an authorized frequency. | |
| 7. At selected crew member's station<br>- hold then release INT/RAD PTT switch in RAD position | - Make certain that reception is inhibited during tuning period (approx. 8 s.) |
| 8. When tuning period is over, hold PTT switch in RAD position | - Make certain that transceiver fan operates. |
| CAUTION : IF TRANSCEIVER FAN DOES NOT OPERATE STOP TRANSMITTING IMMEDIATELY. | |
| 9. While holding PTT switch in RAD position, speak into boomset | - Check quality of reception at boomset |
| 10.Release PTT switch. | |

(c)Simultaneous operation of both HF systems

1 Reception test

| ACTION | RESULT |
|---|---|
| 1. On HF1 control unit<br>- place function selector switch<br>R in AM or SSB position<br>- select transmitting frequency of a station in operation. | |
| 2. On HF2 control unit<br>- place function selector switch in<br>R AM or SSB position<br>- select a transmitting station different from the former one. | |
| 3. At Captain's station<br>- disengage HF1 reception pushbutton, adjust reception level on audio control panel<br>- make certain that all other reception pushbuttons are engaged | |

| ACTION | RESULT |
|---|---|
| on audio control panel<br>- hold **INT/RAD PTT** switch in **RAD** position then release | During tuning period (approx. 8 s.), a 1000 Hz signal is received at boomset. |
| 4. At First Officer's station<br>- disengage HF2 reception pushbutton, adjust reception level on audio control panel<br>- make certain that all other reception pushbuttons are engaged on audio control panel<br>- hold **INT/RAD PTT** switch in **RAD** position then release | During tuning period (approx. 8 s.), a 1000 Hz signal is received at boomset. |
| 5. On panels 419VU and 420VU<br>- turn **LOUDSPEAKER** potentiometer clockwise | Make certain that transmission is received on capt loudspeaker for HF1 and on F/O loudspeaker for HF2. |

2 Transmission test

| ACTION | RESULT |
|---|---|
| 1. On HF1 and HF2 control units<br>- select two authorized frequencies. | |
| 2. On Captain audio control panel<br>- engage HF1 transmission key<br>- disengage HF1 and HF2 reception pushbuttons. | |
| 3. On First Officer audio control panel<br>- engage HF2 transmission key<br>- disengage HF1 and HF2 reception pushbuttons. | |
| 4. On panels 419VU and 420VU<br>- disengage and turn **LOUDSPEAKER** pushbutton clockwise. | |
| 5. Transmit on HF1 system. | |
| 6. Transmit on HF2 system while holding **PTT** switch in **RAD** position on HF1 system | Make certain that HF2 transmission is not received at loudspeakers. |
| 7. With **PTT** switches in intermediate | |

| ACTION | RESULT |
|---|---|
| position on HF1 system, transmit on HF2 system. | |
| 8. Transmit on HF1 system while holding PTT switch in RAD position on HF2 system | Make certain that HF1 transmission is not received at loudspeakers. |

(3)Close-up
(a)On audio control panels
- engage HF1 reception key
- engage INT transmission key.
(b)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(c)Restore system and aircraft to normal operating conditions.

## HF ANTENNA - REMOVAL/INSTALLATION

**WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT MAKE CERTAIN THAT ELECTRICAL CIRCUITS, UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.**

### 1. Reasons for the Job

A. Replacement of defective antenna.

### 2. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 10 m (33 ft.) |
| B. | Warning Notices |
| C. | Crane |
| D. | Hoisting Equipment |
| E. Material No. 16-003 | Structure Paints (Ref. 20-31-00) |

Referenced Procedures

| | |
|---|---|
| - 55-32-11, P. Block 401 | Vertical Stabilizer Leading Edge |
| - 23-11-00, P. Block 501 | HF System |

### 3. Procedure

A. Job Set-Up

(1)Statically ground aircraft.

(2)Place warning notices on rudder and elevator controls in flight compartment.

(3)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO - NAV & COM - HF1 | 4RE1 | 106/D 3 |
| 21VU | RADIO - NAV & COM - HF2 | 4RE2 | 106/D12 |
| 21VU | FAC1/28VDC | 306CC1 | 103/G 3 |
| 21VU | FAC1/115VAC | 309CC1 | 103/G 5 |
| 21VU | FAC1/26VAC | 305CC1 | 103/G 7 |
| 21VU | FAC2/26VAC | 305CC2 | 103/G 8 |
| 21VU | FAC2/115VAC | 309CC2 | 103/G10 |
| 21VU | FAC2/28VDC | 306CC2 | 103/G12 |

(4)Position access platform at Zone 322.

(5)Position crane and hoisting equipment at Zone 322.

(6)Remove vertical stabilizer lower leading edge panel (Ref. 55-32-11, P. Block 401).

B. Removal (Ref. Fig. 401)

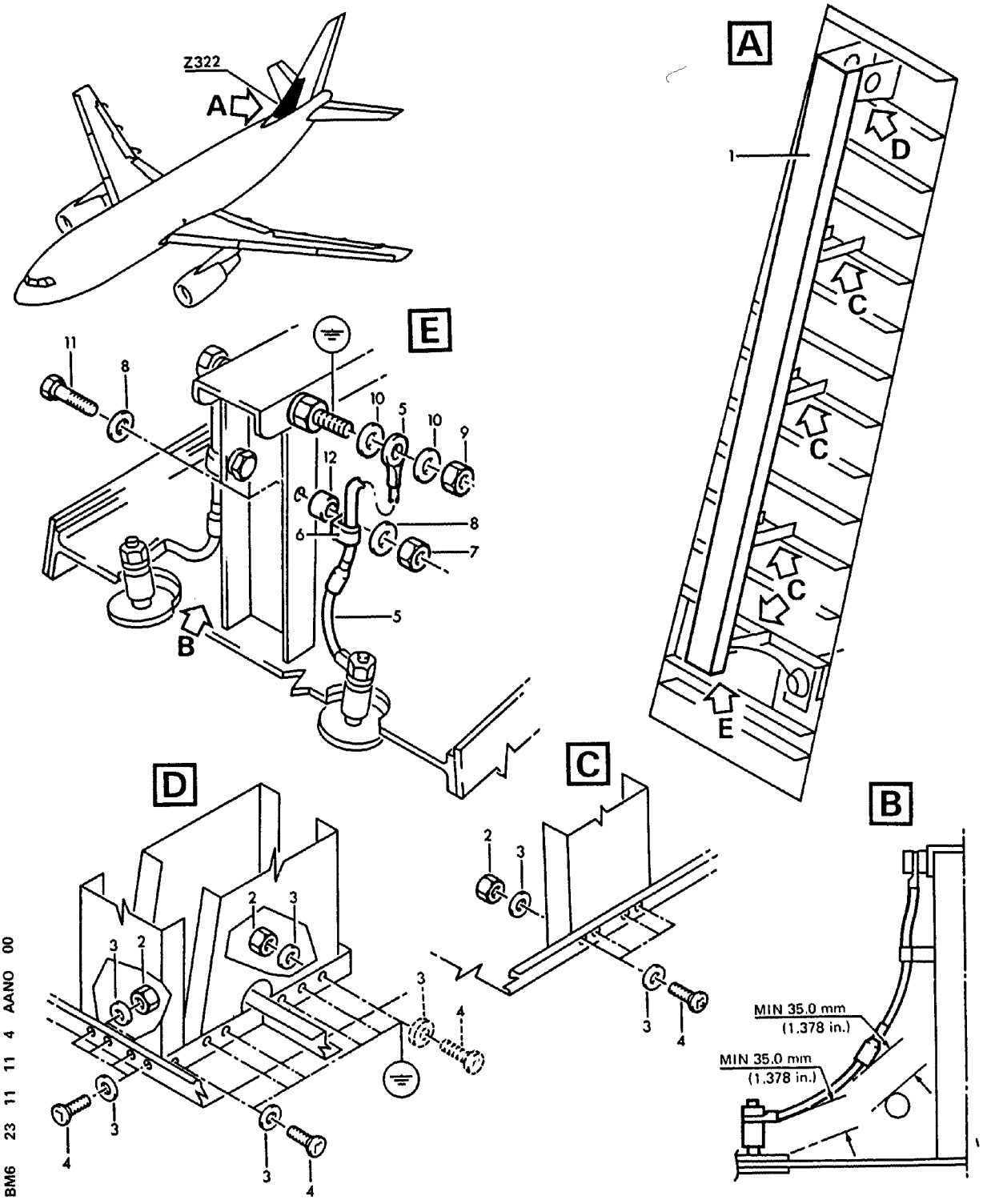
(1)Remove nuts (9) and washers (10) and disconnect feeders (5) from antenna (1).

(2)Remove screws (11), washers (8), clamp (6), spacer (12), if installed, and nuts (7).
(3)Remove screws (4), washers (3) and nuts (2) and lift off antenna (1).

C. Installation
(1)Position antenna (1) and install to structure with screws (4), washers (3) and nuts (2).
(2)Connect feeders (5) to existing bolts with washers (10) and nuts (9).
(3)Install clamps (6) with screws (11), washers (8) and nuts (7).
NOTE : For dimensions of feeder position refer to illustration, detail E.
NOTE : If feeders (5) are too short, install with spacers (12).
(4)Coat feeder connections with lacquer (Mat. No. 16-003). (Ref. Fig. 401)

D. Test
(1)Test high frequency system (Ref 23-11-00, P. Block 501).

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Install vertical stabilizer lower leading edge panel (Ref. 55-32-11, P. Block 401).
(3)Remove access platform.
(4)Remove crane and hoisting equipment.
(5)Remove warning notices from rudder and elevator controls in flight compartment.
(6)Remove static ground connection.




HF Antenna
Figure 401

## HF CONTROL UNIT 2RE1 (2RE2) - REMOVAL/INSTALLATION

R NOTE : Removal/installation procedures for HF1 and HF2 control units 2RE1 and
R 2RE2 are identical.

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |
| Referenced Procedure<br>- 23-11-00, P. Block 501 | HF System |

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers :
(a)For HF1 control unit 2RE1

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO NAV & COM/HF1 | 4RE1 | 106/D 3 |
| 132VU | INTEGRAL LT/C/B & OVHD & PED | 3LF | 322/N77 |

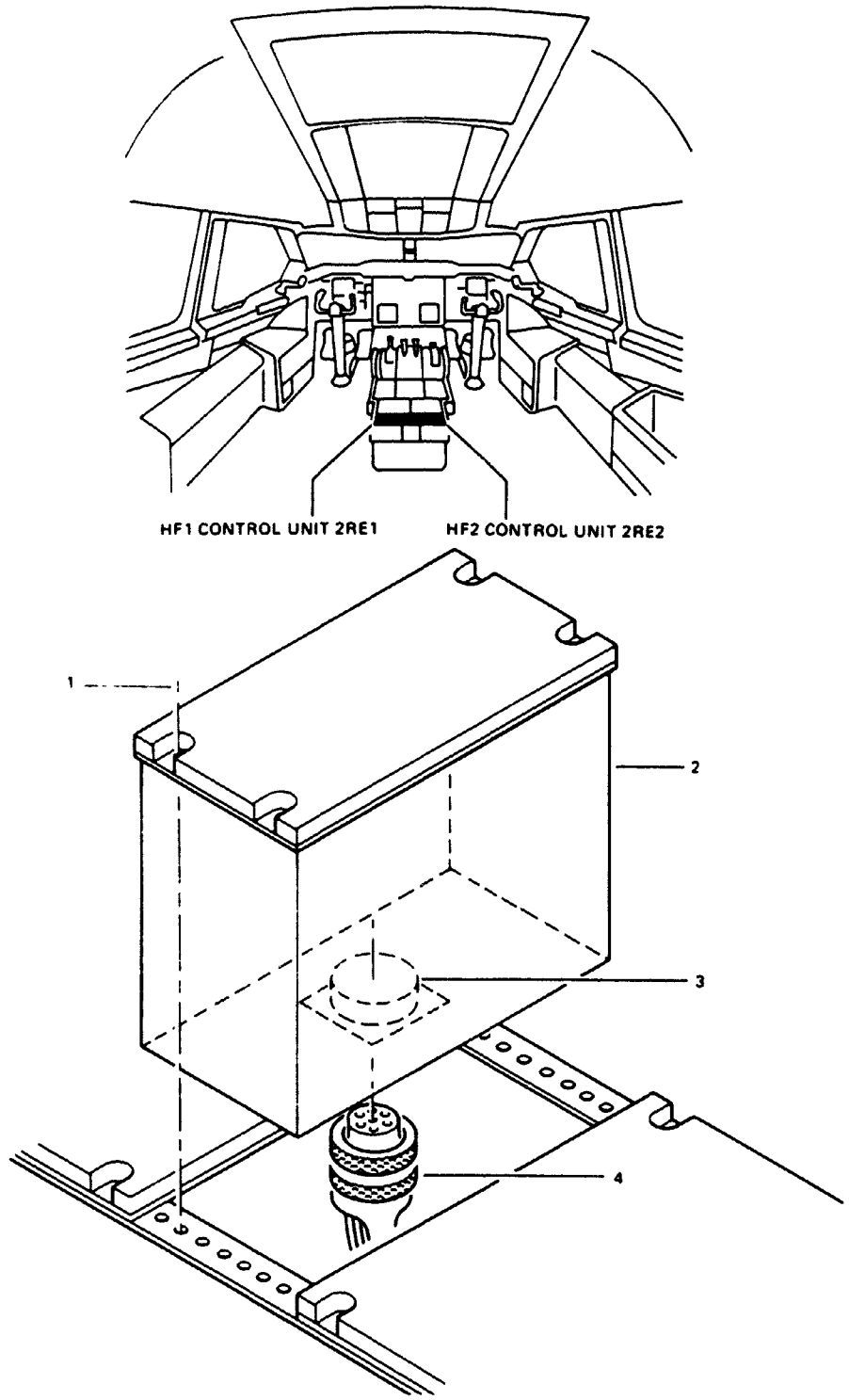
(b)For HF2 control unit 2RE2

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO NAV & COM/HF2 | 4RE2 | 106/D12 |
| 132VU | INTEGRAL LT/C/B & OVHD & PED | 3LF | 322/N77 |

B. Removal
(1)Unlock Dzus fasteners (1) and pull out HF control unit (2).
(2)Disconnect electrical connector (4).
(3)Remove HF control unit (2).
(4)Cap electrical connectors (3) and (4).

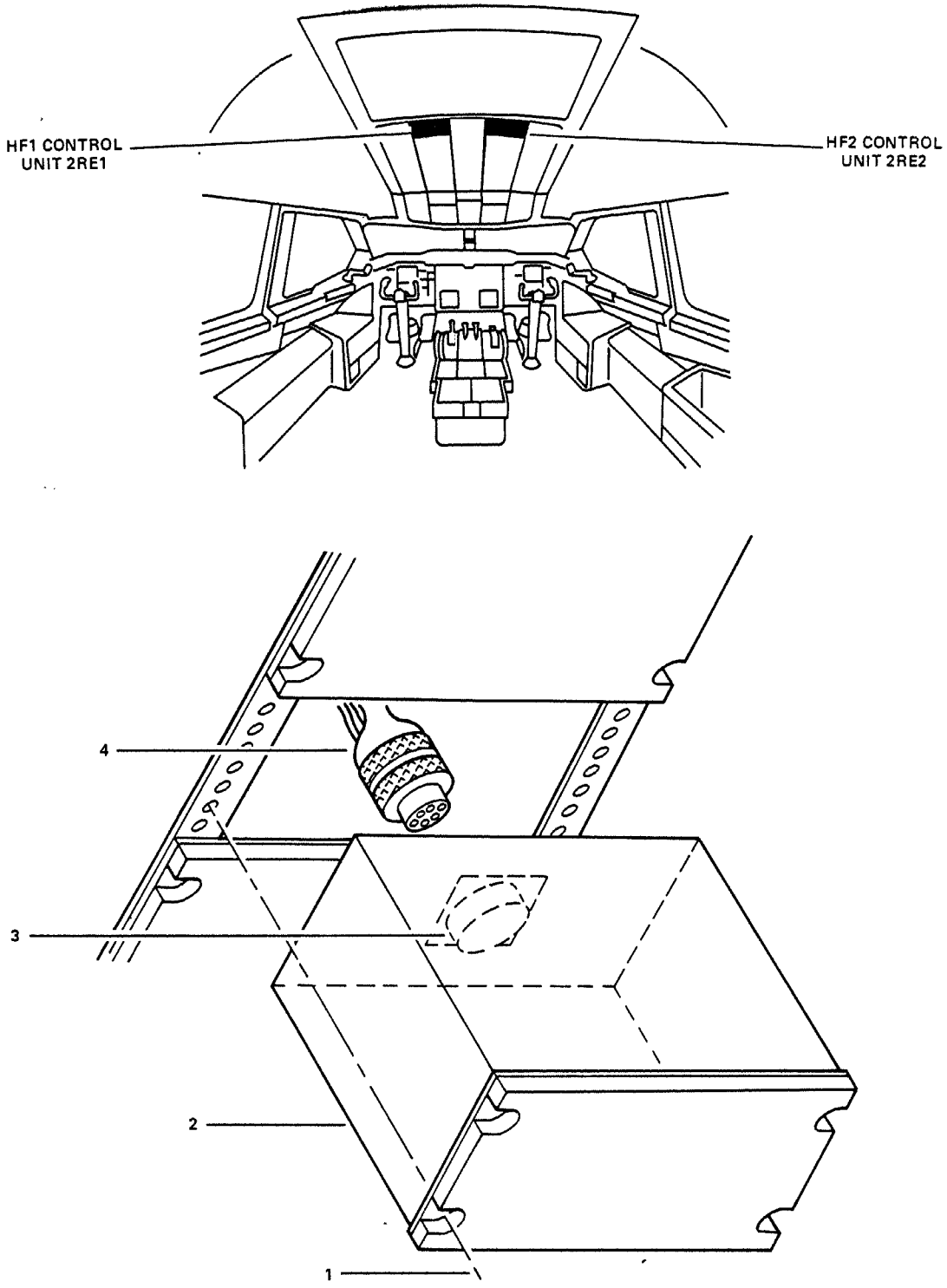
C. Installation
(1)Clean and inspect HF control unit (2) interface.
(2)Remove blanking caps from electrical connectors (3) and (4). Check for correct condition of electrical connectors.
(3)Install HF control unit (2) and attach with Dzus fasteners (4).
(4)Remove safety clips and tags and close circuit breakers 4RE1, 4RE2 and 3LF.

D. Test
Carry out an operational test of HF system (Ref. 23-11-00, P. Block 501, paragraph 1.C. (2) (a)).




HM5, 23 11 13 4 S1A0 13

HF Control Unit
Figure 401




HF Control Unit
Figure 402

E. Close-Up
Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

## HF TRANSCEIVER 1RE1 (1RE2) - REMOVAL/INSTALLATION

NOTE : Removal/installation procedures for HF1 and HF2 transceivers 1RE1 and 1RE2 are identical.

### 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |
| Referenced Procedure<br>- 23-11-00, P. Block 501 | HF System |

### 2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers :

(a)For HF1 transceiver 1RE1

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO NAV & COM/HF1 | 4RE1 | 106/D 3 |

(b)For HF2 transceiver 1RE2

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO NAV & COM/HF2 | 4RE2 | 106/D12 |

(2)Open access door 121 BL.

B. Removal

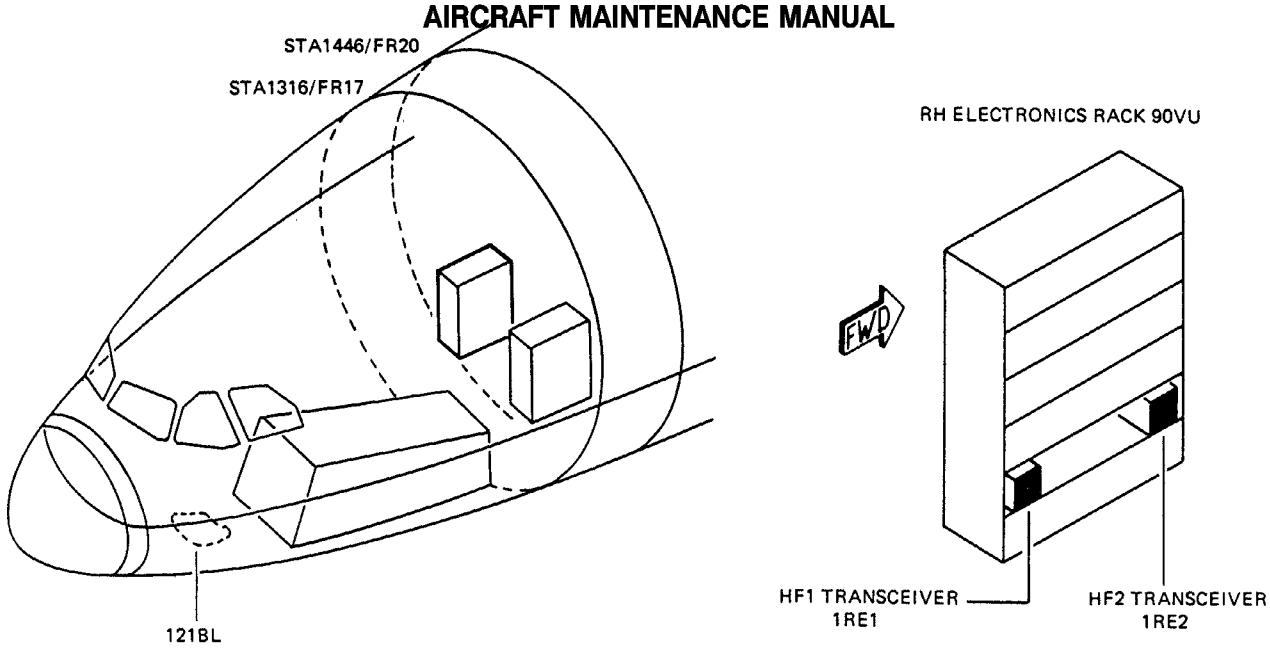
(1)Unscrew knurled nuts (4) and free lugs (3) on HF transceiver (2).
(2)Withdraw HF transceiver from mount (5).
(3)Remove HF transceiver (2).
(4)Cap electrical connectors (1).

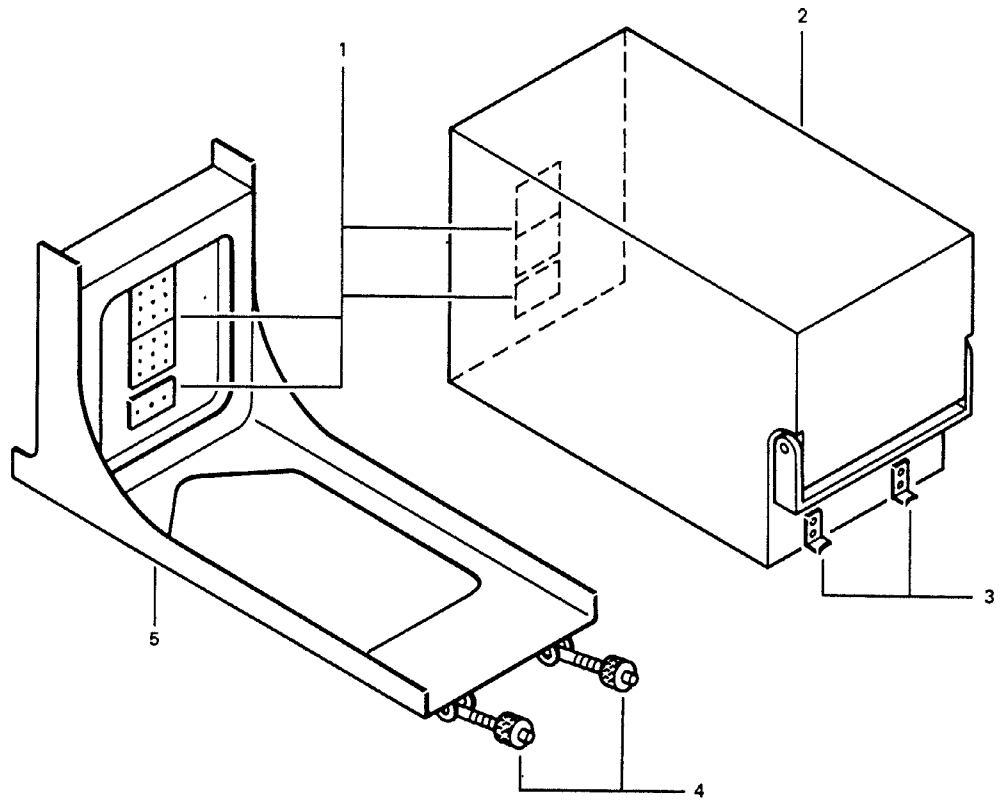
C. Installation

(1)Clean and inspect HF transceiver (2) interface.
(2)Remove blanking caps from electrical connectors (1).
Check for correct condition of connectors.
(3)Position HF transceiver (2) on mount (5) and fully push.
(4)Position knurled nuts (4) and tighten onto lugs (3) of HF transceiver.
(5)Remove safety clips and tags and close circuit breakers 4RE1 and 4RE2.

D. Test

Carry out an operational test of HF system (Ref. 23-11-00, P. Block 501).




BM5 23 11 33 4 BAM2·07

HF Transceiver
Figure 401

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close access door 121BL.

## HF ANTENNA COUPLER - REMOVAL/INSTALLATION

**WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT MAKE CERTAIN THAT THE CIRCUITS, UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.**

### 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 6 m (19 ft.) |
| B. | Warning Notices |
| C. | Blanking Caps |

| Referenced Procedure | |
|---|---|
| - 23-11-00, P. Block 501 | HF System |

### 2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO - NAV & COM-HF1 | 4RE1 | 106/D 3 |
| 21VU | RADIO - NAV & COM-HF2 | 4RE2 | 106/D12 |
| 21VU | FAC1/28VDC | 306CC1 | 103/G 3 |
| 21VU | FAC1/115VAC | 309CC1 | 103/G 5 |
| 21VU | FAC1/26VAC | 305CC1 | 103/G 7 |
| 21VU | FAC2/26VAC | 305CC2 | 103/G 8 |
| 21VU | FAC2/115VAC | 309CC2 | 103/G10 |
| 21VU | FAC2/28VDC | 306CC2 | 103/G12 |

(2)Place warning notices on rudder and elevator controls in flight compartment.

(3)Position access platform, open access door 312AR.

(4)Position stepladder if required, open access door 311AZ.

B. Removal (Ref. Fig. 401)

NOTE : Removal/Installation procedures of HF1 and HF2 antenna couplers are similar.

(1)Disconnect electrical connectors (2) from antenna coupler.

(2)Cap electrical connectors.

(3)Loosen hold-down fasteners (4) at mount by turning knurled nuts (3) counterclockwise.

(4)Hold antenna coupler (1) in position and open hold-down fastener (4).

(5)Carefully withdraw antenna coupler (1) from mount.

C. Installation

(1)Carefully slide antenna coupler (1) into mount and hold in position.

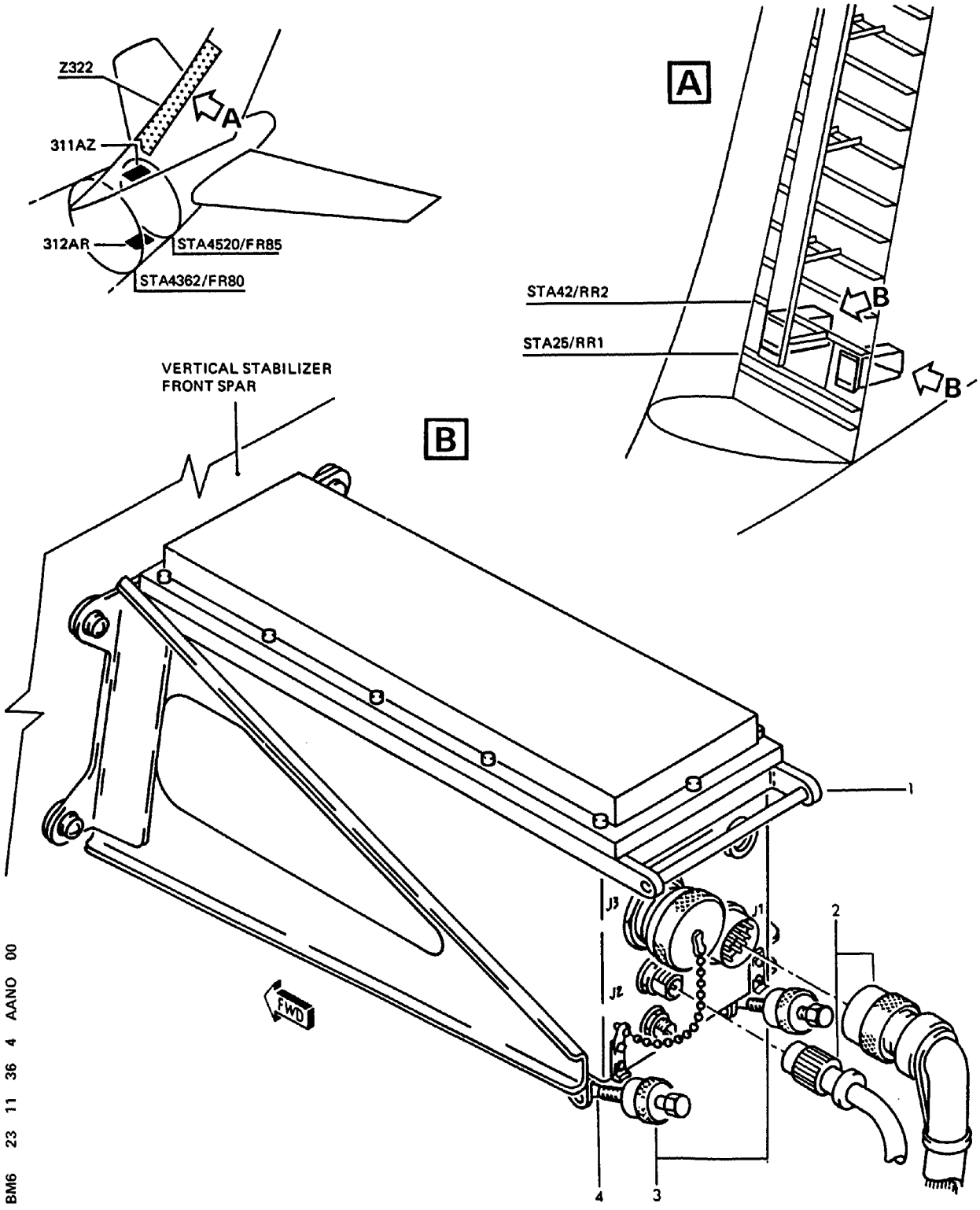
NOTE : Check that connection of HF antenna feeder fits correctly.

(2)Close hold-down fasteners (4) at mount.

(3)Turn knurled nuts (3) of hold-down fasteners (4) clockwise, until antenna coupler is secured firmly.
(4)Remove caps from electrical connectors.
(5)Connect electrical connectors (2) to antenna coupler (1).
(Ref. Fig. 401)

D. Test
Carry out the HF SYSTEM test (Ref. 23-11-00, P. Block 501).

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close access doors 311AZ and 312AR.
R (3)Close circuit breakers in para A. Job Set-Up.
(4)Remove warning notices from flight compartment.
(5)Remove access platform.




HF-Coupler
Figure 401

# VHF SYSTEM - DESCRIPTION AND OPERATION

## 1. General

The Very High Frequency (VHF) system serves for all short-range voice communications between different aircraft in flight, between aircraft in flight or on the ground and ground stations.
The aircraft is equipped with three identical VHF systems which are fully independent of each other.

## 2. Component Location

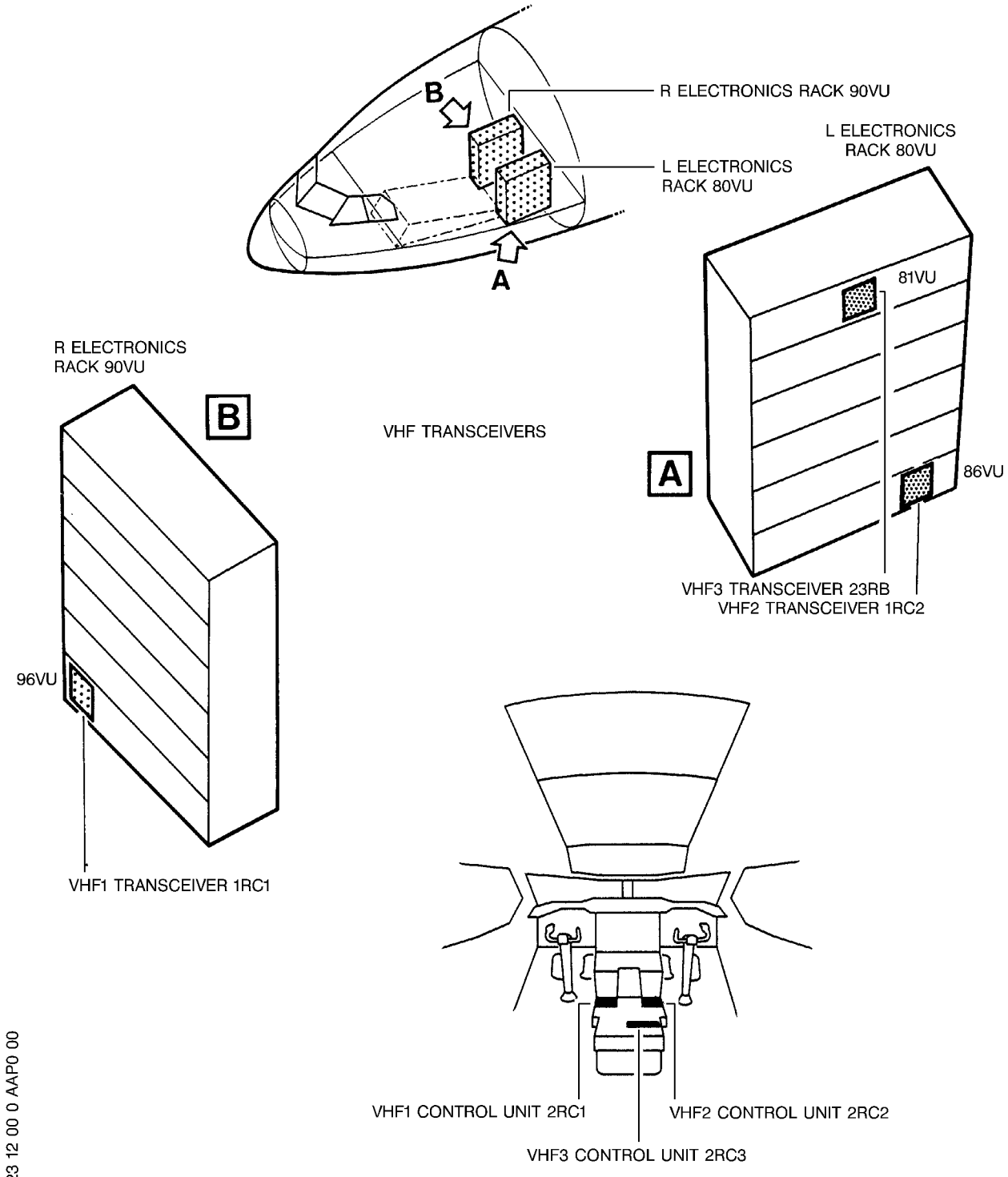
(Ref. Fig. 001)
(Ref. Fig. 002)

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 1RC1 | Transceiver - VHF, 1 | 96VU | 122 | 121BL | 23-12-33 |
| 1RC2 | Transceiver - VHF, 2 | 86VU | 121 | 121BL | 23-12-33 |
| 23RB | Transceiver - VHF, 3 | 81VU | 121 | 121BL | 23-12-33 |
| 2RC1 | CTL Unit - VHF, 1 | 11VU | 210 | 121BL | 23-12-13 |
| 2RC2 | CTL Unit - VHF, 2 | 11VU | 210 | 121BL | 23-12-13 |
| 2RC3 | CTL Unit - VHF, 3 | 11VU | 210 | 121BL | 23-12-13 |
| 3RC1 | Antenna - VHF,1 | | 230 | | 23-12-11 |
| 3RC2 | Antenna - VHF,2 | | 154 | | 23-12-11 |
| 25RB | Antenna - VHF,3 | | 240 | | 23-12-11 |

## 3. System Description

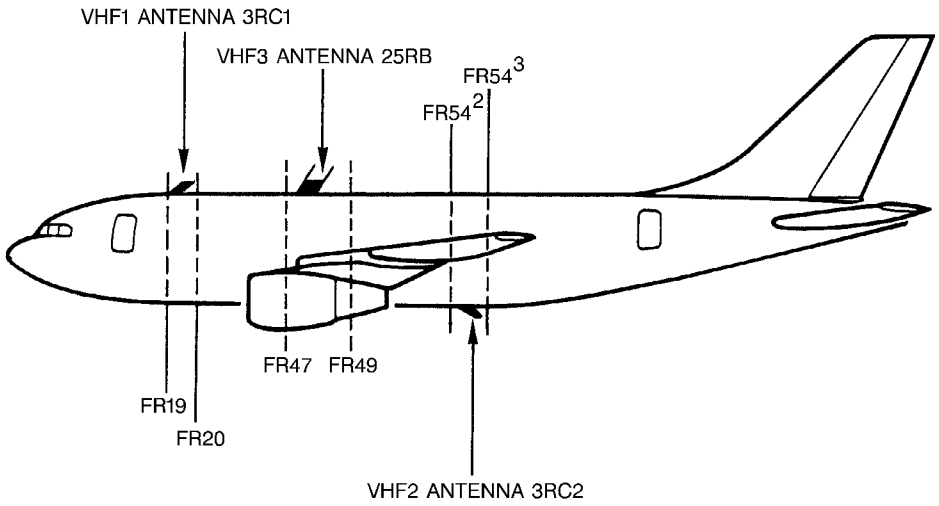
Each system consists of :
- a VHF transceiver
- a VHF control unit
- a VHF antenna

Both systems are associated with the audio integrating system.




BM5 23 12 00 0 AAP0 00

VHF System - Component Location
Figure 001




BM5 23 12 00 0 ABP0 00

VHF System - Antenna Location
Figure 002

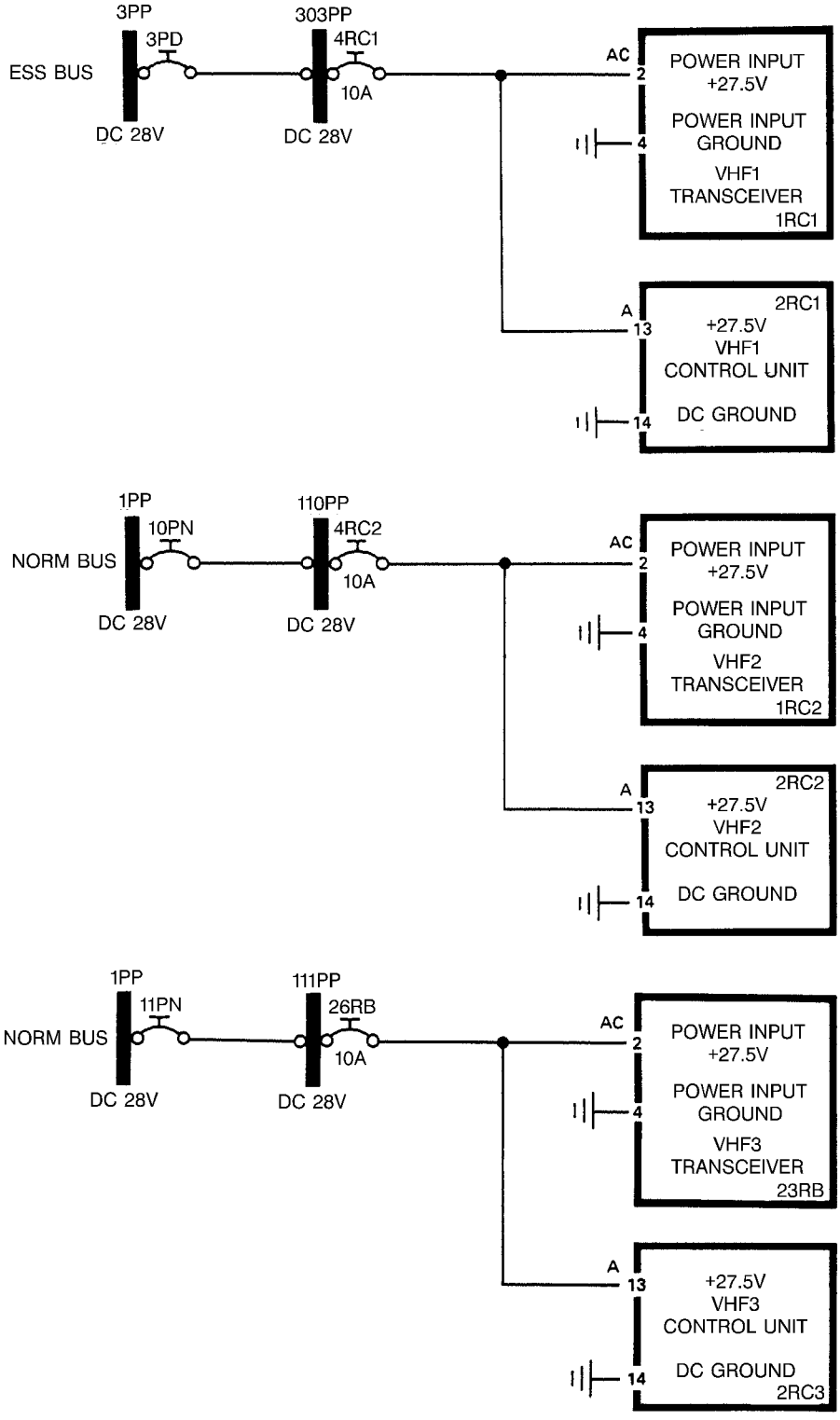
4. Electrical Power Supply (Ref. Fig. 003)

A. VHF1 System
The VHF1 system is supplied with 28VDC from ultimate emergency busbar 3PP via busbar 303PP through 10A MIN EQPT BAY SUPPLY circuit breaker 4RC1 located on circuit breaker panel 22VU (208).

B. VHF2 System
The VHF2 system is supplied with 28VDC from Normal busbar 1PP via busbar 110PP through 10A circuit breaker 4RC2 located on circuit breaker panel 21VU (106).

C. VHF3 System
The VHF3 system is supplied with 28VDC from Normal busbar 1PP via busbar 111PP through 10A circuit breaker 26RB located on circuit breaker panel 21VU (106).
(Ref. Fig. 004)

5. System Architecture
(Ref. Fig. 005)
VHF1, VHF2 and VHF3 systems are identical :
- the VHF control unit enables selection of the operating frequency generated in the transceiver
- the VHF transceiver generates the operating frequency
  . the transmitter part transmits the modulated signals to the VHF antenna
  . the receiver part receives the signal from the VHF antenna or the transceiver (sidetone).
    This demodulated signal is fed to the audio integrating system, the SELCAL system and the DFDAU.
- the VHF antenna transmits the modulated signals from the transmitter. It also receives the VHF signals and then transmits them to the receiver.
- the circuit breaker supplies the VHF system with 28VDC.




BM5 23 12 00 0 ACP0 00

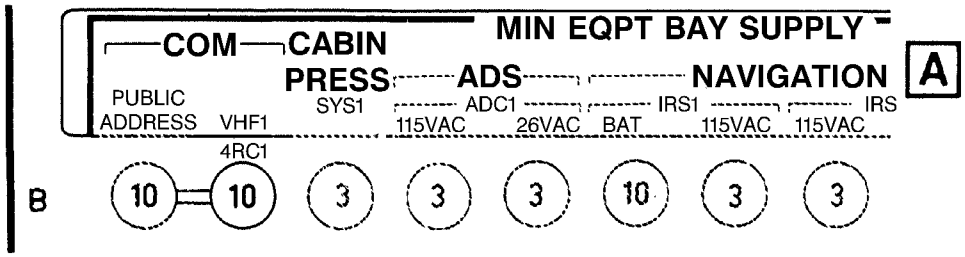
VHF System - Electrical Power Supply
Figure 003

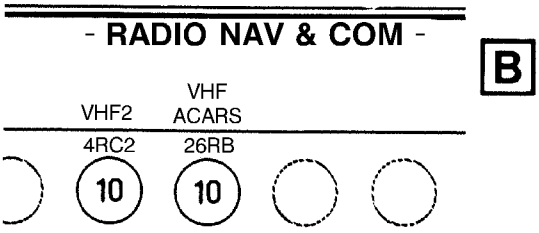
R EFFECTIVITY: 101-104,

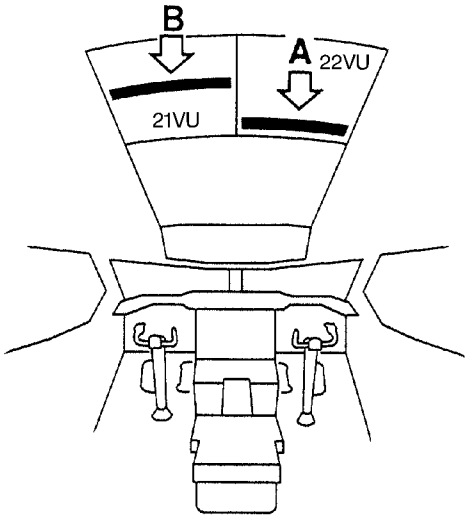
PIA



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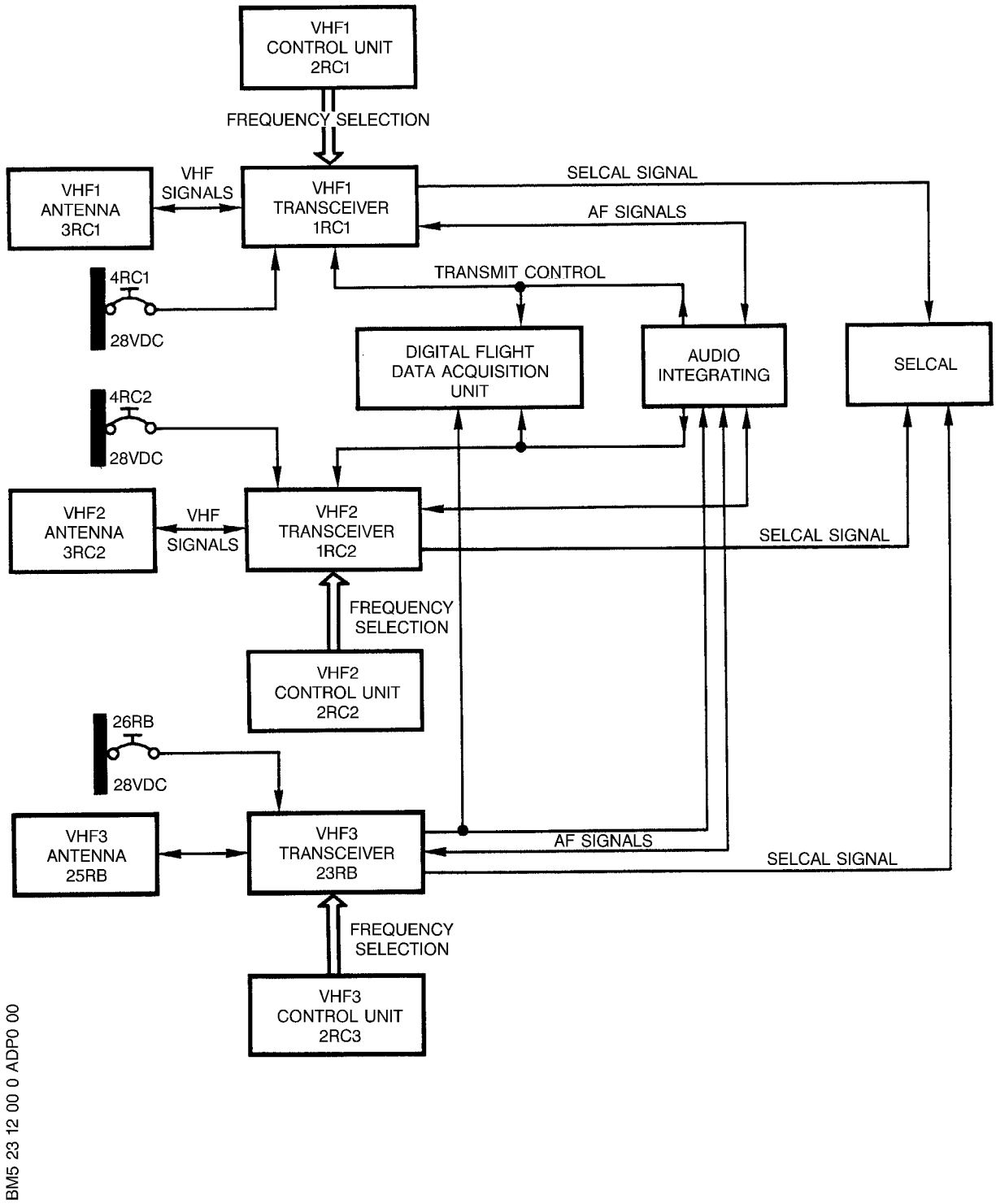



BM5 23 12 00 0 AGP1 00

VHF System - Circuit Breaker Location
Figure 004




VHF System - Block Diagram
Figure 005

6. VHF Transceiver

A. Description

The communications transceiver conforms to ARINC characteristic 716. Its case size is 3 MCU, in compliance with ARINC 600 standards.

(1)VHF transceiver face

R **ON A/C 101-104,

(Ref. Fig. 006)

R **ON A/C 101-104,

The face features :
- two jacks (PHONE and MIC)
- a TEST pushbutton switch to check system for correct operation
- a green LRU PASS indicator light
- a red CONTROL INPUT FAIL warning light
- a SQL/LAMP TEST pushbutton switch
- a forward/reflected power display with associated RFL/OFF/FWD selector switch
- a carrying handle
- an identification plate.

(2)VHF transceiver back

The back is equipped with three connectors to enable :
- connection with power supply and antenna circuits (BP)
- connection with peripheral circuits (control unit, audio integrating, etc. MP)
- connection with an ATE (automatic test equipment) system (TP).

B. Characteristics

The VHF transceiver complies with the standards defined in ARINC 716 and 600.

It enables transmission and reception of :
- radio communication phonic messages through electroacoustic equipment (headset, hand microphone, boomset and loudspeaker)
- coded messages in keeping with ARINC 429.

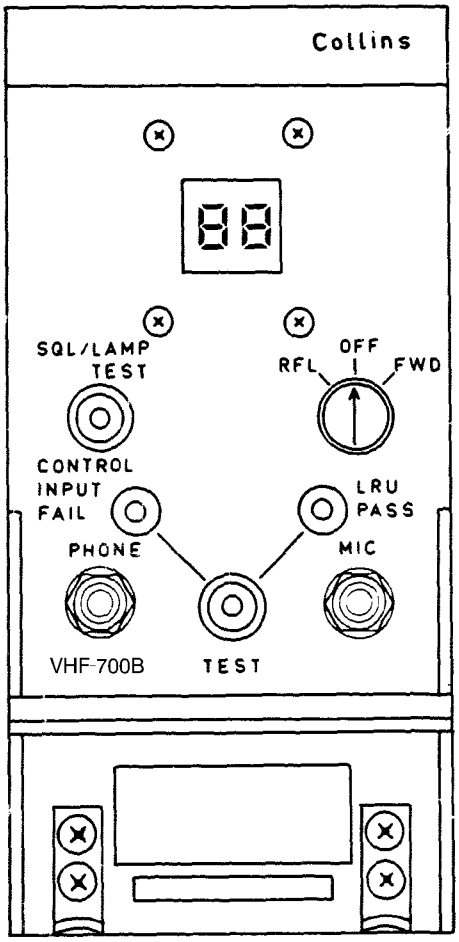
R **ON A/C 101-104,

The VHF transceiver operates in the 118.000 to 136.975 MHz frequency range in 2278 channels spaced by 8.33 KHz.

Its main characteristics are :

(1)Transmitter

| | |
|---|---|
| Output power | 25 W minimum |




BM5 23 12 00 0 CWM0 00

VHF Transceiver Face
Figure 006

| | |
|---|---|
| Antenna impedance | 50 ohms |
| (2)Receiver | |
| Output power | ≥ 50 mW into 600 ohms |
| Sensitivity | 2 μV for 6 dB (s + n)/n |
| Selectivity | 6 dB at ±8 KHz<br>60 dB at ±17 KHz |
| (3)Power Supply | |
| Voltage | 27.5 ±0.5VDC |
| Current | 1.3A, receive mode<br>7.6A, transmit mode |

C. Operation

(1)Power supply (Ref. Fig. 007)

R **ON A/C 101-104,

The aircraft power (pin 2, connector BP) is applied to the power transmitting circuit and to an overvoltage protection circuit through an input filter. At the output, a switching regulator circuit provides six regulated dc voltages (+9 V, +5 V, -12 V, +12 V, +17 V and +19 V) required for operation of the various parts of the equipment.
The synthesizer contains regulating circuits (+16 V, +5 V) from voltages (+19 V, +9 V) delivered by the main power supply circuits.

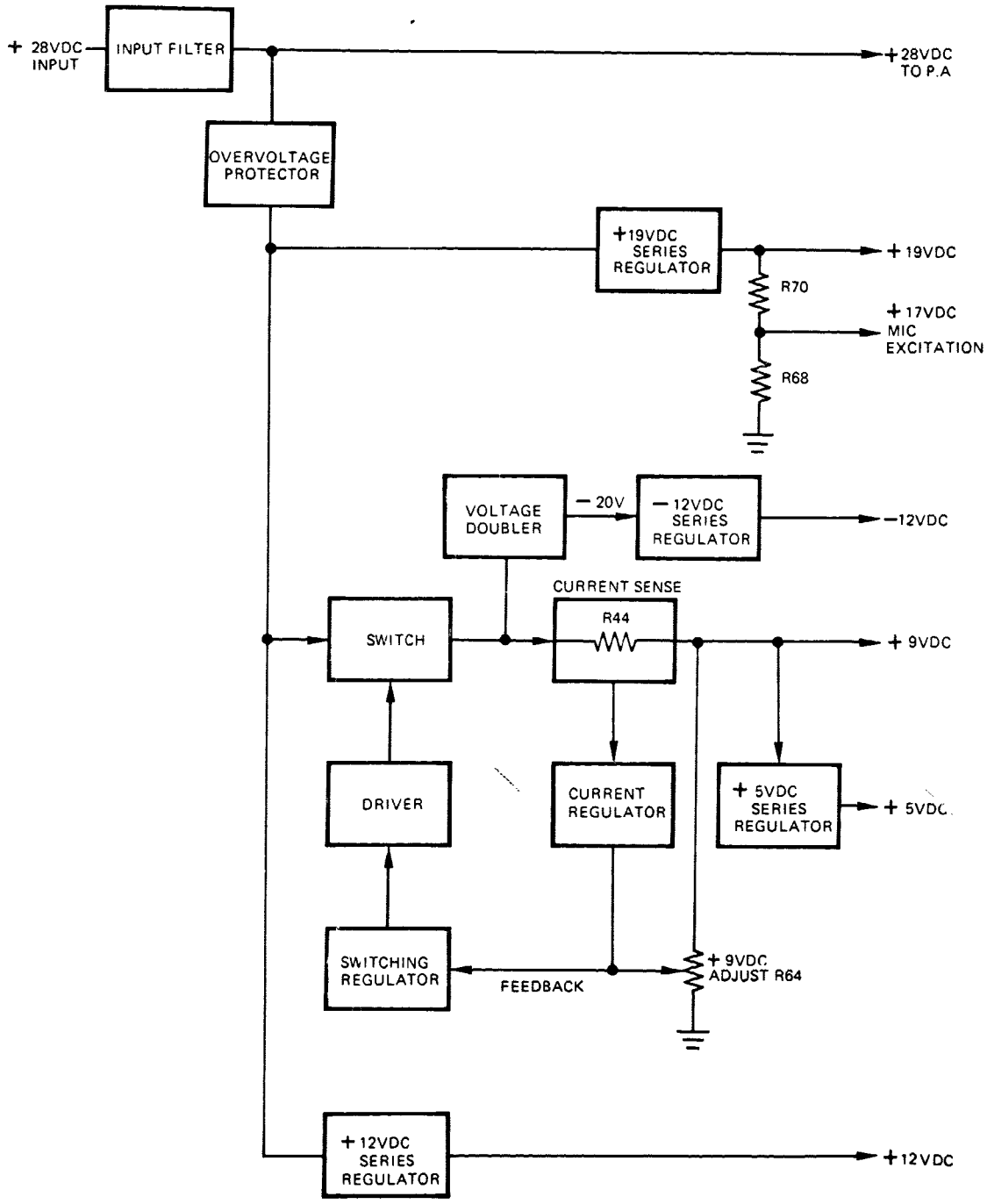
(2)Receiver

R **ON A/C 101-104,

(Ref. Fig. 008)

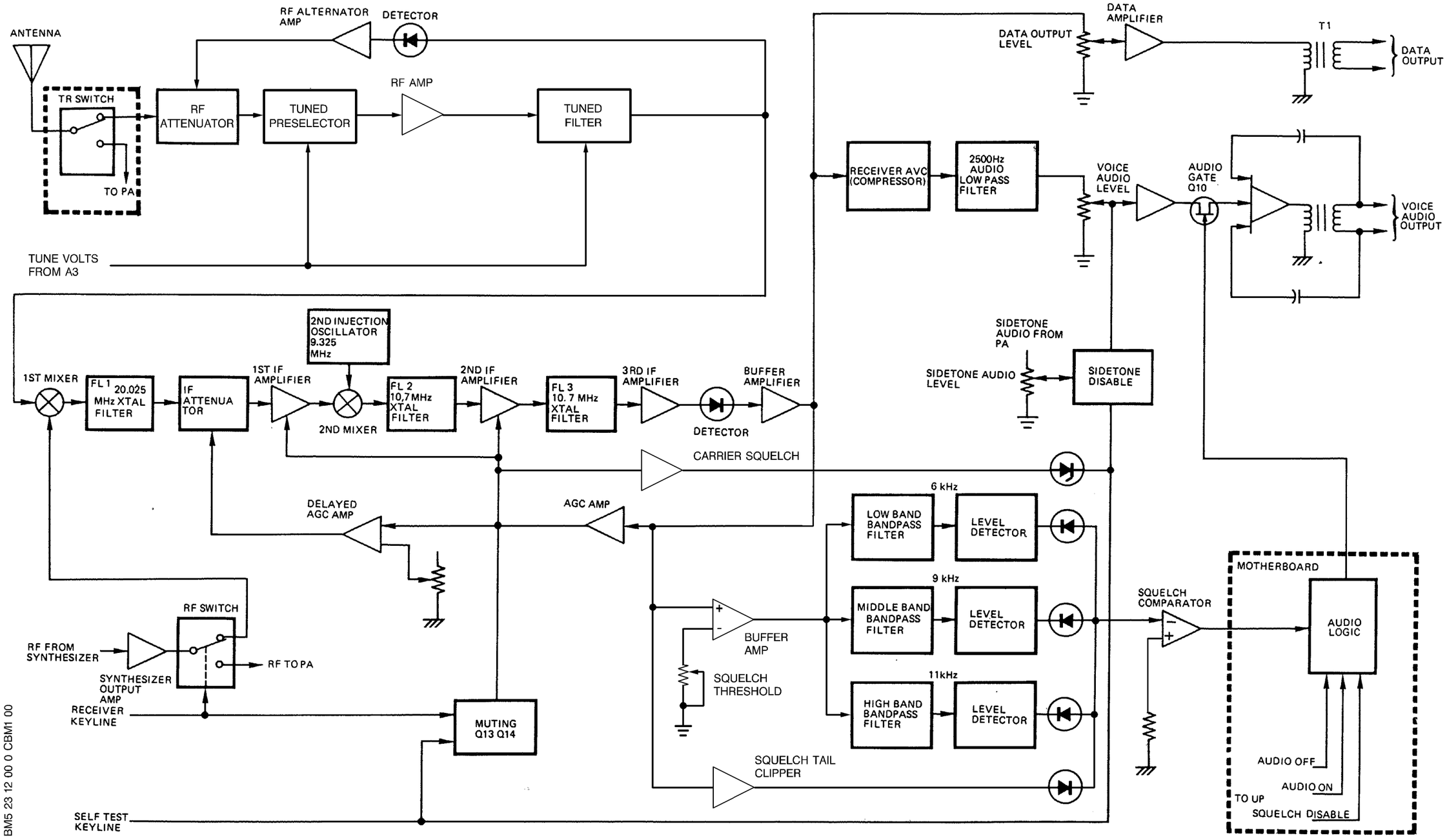
R **ON A/C 101-104,

In receive mode, the incoming modulated RF signal from the antenna is routed to an input attenuator by the solid-state antenna switch.
The attenuator driver is controlled by delayed AGC and feedback through the RF detector.
The output signal of the preselector is fed through an RF attenuator to a high-level, low-noise amplifier providing a gain of 12 dB.
A portion of the amplifier output is used to drive the attenuator which adjusts the amplifier input level and maintains it constant. The amplifier output signal is then applied to one of two low-pass filters.
Selection of the low band or high band filter is made depending on the received frequency (118 to 127.975 MHz or 128 to 136.975 MHz). These filters prevent the undesired frequencies from being fed back to the antenna. They also filter out image frequency signals that may appear above the desired frequency.
After filtering, the signal is applied to a first mixer where it is mixed with the signal from the frequency synthesizer of following F value :
F = F of received signal + 20.025 MHz to create a first intermediate frequency of 20.025 MHz.
This first IF output is then filtered by a crystal filter and amplified (40 dB of gain depending on AGC).
If the amplifier input signal exceeds 700 µV, an attenuator is activated by the AGC circuit to prevent overload of the amplifier.
The signal is then applied to a second mixer. This mixer receives the modulated 20.025 MHz signal and a 9.325 MHz frequency signal produced by a crystal oscillator.




BM5 23 12 00 0 BJMO

VHF System - Power Supply
Figure 007




BM5 23 12 00 0 CBM1 00

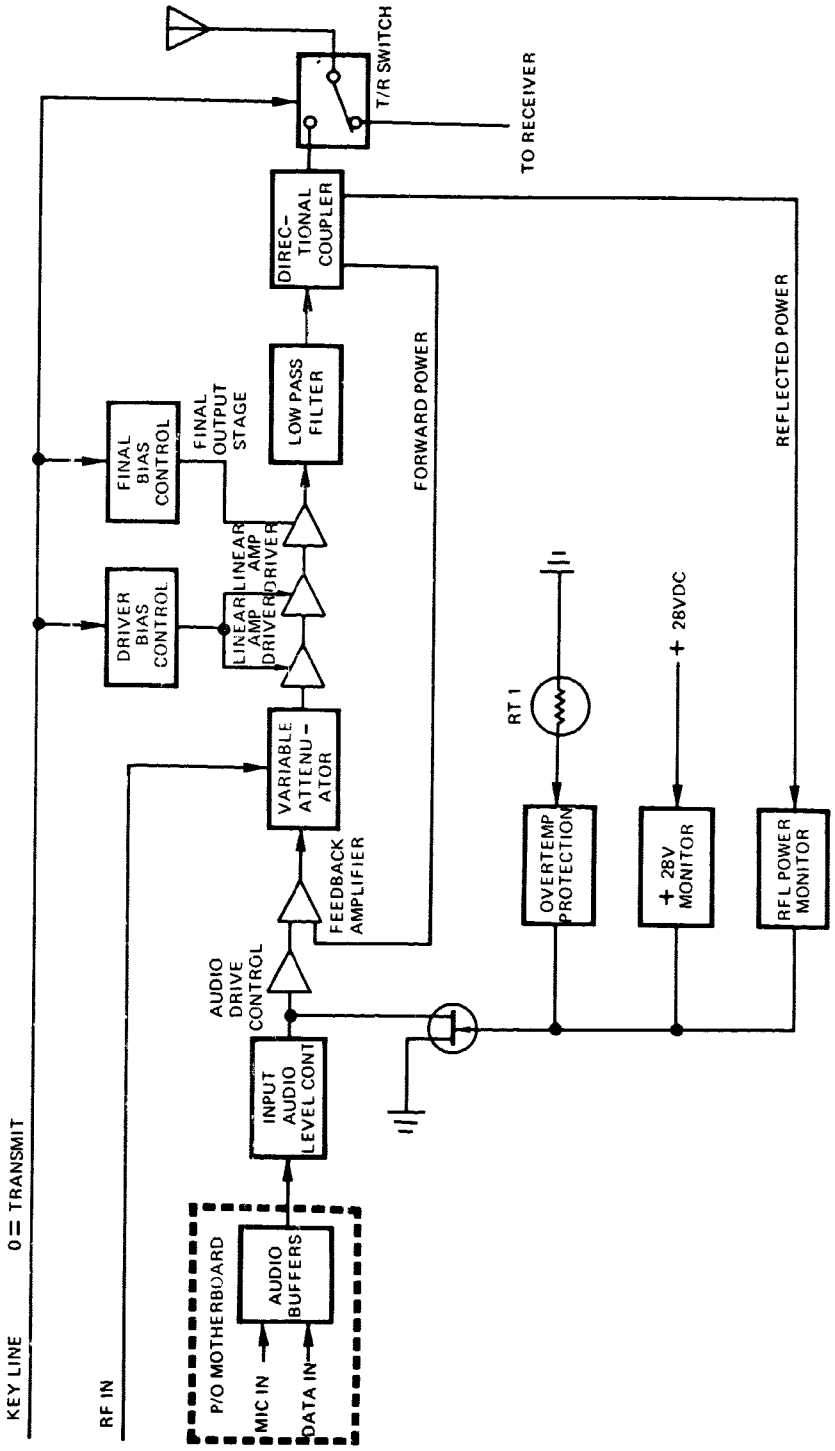
Receiver
Figure 008

The output provides a second IF signal of 10.7 MHz.
This second IF signal is filtered and amplified twice before detection.
Both IF amplifiers provide a gain of 70 dB.
The complete amplification channel provides a total gain of 110 dB.
The modulated signal is then applied to a detection circuit and to a buffer amplifier. This detection circuit also controls the AGC circuit which controls the IF amplifier gain and the delayed AGC circuit. The latter controls the first IF signal attenuator and limits the amplifier input signal at 700 $\mu$V.
The buffer amplifier output demodulated signal is applied to the data circuit, audio circuit and squelch circuit.
As far as data circuit is concerned, the signal is amplified and applied to a transformer which provides an adjustable output voltage.
For the audio circuit, the demodulated signal is applied to a compressor (automatic volume control : AVC) to maintain a constant audio output level.

The compressor output signal is applied to a low pass filter comprising three stages, which eliminates all the frequencies greater than 2.5 KHz and lower than 300 Hz. The signal is then amplified and is fed through an AF control circuit (audio gate) activated by the squelch circuit.
It is amplified again and applied to the output amplifier which provides an output power comprised between 0.5 and 50 mW into 600 ohms.
A feedback circuit reduces distortions in the final amplifier and enables the receiver to be connected to an open or short circuit without damage.
For the squelch circuit, the demodulated signal from the buffer amplifier is applied to three circuits consisting of bandpass filters and level detectors. The bandpass filters are identical but centered on different frequencies : 6, 9 and 11 KHz.
These frequencies were selected so that transmissions in offset carrier (CLIMAX network) are not processed as noise.
Reception of a signal on at least one of these frequencies reduces the received noise through these filters and level detector which results in improving the signal-to-noise ratio.
The level detector(s) detect the ratio variation and activate the squelch comparator which controls the audio frequency gate through a logic circuit and as a function of its adjustment threshold.

(3)Transmitter (Ref. Fig. 009)

The signal from the microphone or data circuit is applied through a buffer amplifier to a low-pass filter and compressor. The compressor maintains a constant modulation percentage (90%) regardless of the audio input level.
The output signal is sent to an audio drive control circuit. This circuit checks the transmitter output final power depending on : the final stage temperature, the reflected power and the 28 V power supply.
The audio signal is then sent to one input of the feedback amplifier which receives the output transmitted signal on another input (transmitted power).
These two signals are compared in the amplifier which delivers a linear output signal.
The amplifier output is applied to one input of a variable attenuator which receives the VHF signal from the frequency synthesizer on the other input.
The VHF signal is modulated in amplitude after it has been fed into the variable attenuator by the regulated audio signal.
This signal is then amplified, filtered and sent to the antenna via a static relay.




BM5 23 12 00 0 BNMO

Transmitter
Figure 009

R **ON A/C 101-104,

The signal from the microphone or data circuit is applied through a buffer amplifier to a low-pass filter and compressor. The compressor maintains a constant modulation percentage (90%) regardless of the audio input level.
The output signal is sent to an audio drive control circuit. This circuit checks the transmitter output final power depending on : the final stage temperature, the reflected power and the 28 V power supply.
The audio signal is then sent to one input of the feedback amplifier which receives the output transmitted signal on another input (transmitted power).
These two signals are compared in the amplifier which delivers a linear output signal.
The amplifier output is applied to one input of a variable attenuator which receives the VHF signal from the frequency synthesizer on the other input.
The VHF signal is modulated in amplitude after it has been fed into the variable attenuator by the regulated audio signal.
This signal is then amplified, filtered and sent to the antenna via a static relay.

(4)Frequency synthesizer

R **ON A/C 101-104,

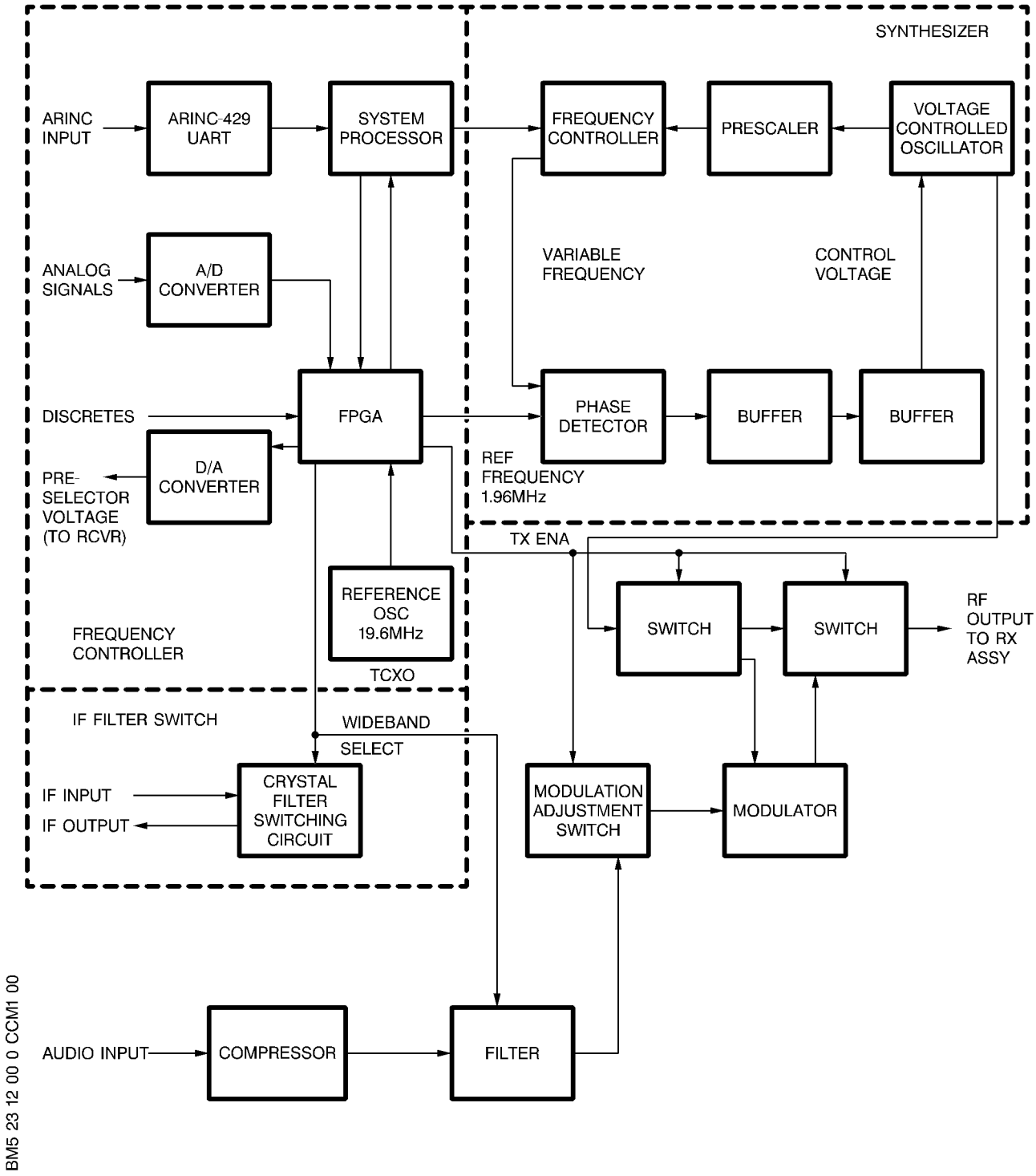
(Ref. Fig. 010)

R **ON A/C 101-104,

The frequency synthesizer provides VHF signals in the frequency range between 118 and 158 MHz with 8.33 KHz or 25 KHz spacing.
It is composed of a 1.96-MHz temperature-compensated crystal oscillator (TCXO) and two voltage-controlled oscillators (VCO'S).
The voltage-controlled oscillators are used to provide the VHF voltages in receive and transmit modes.
The frequency accuracy of these oscillators is checked by the 1.96-MHz crystal oscillator.

(5)ARINC 429 Message Decoding Circuit

The ARINC 429 bus receivers transform the ARINC 429 message into TTL logic signals which are fed to the microprocessor. After processing, the microprocessor sends information to the synthesizer.
The microprocessor continuously checks the received message.
In the event of a fault, the microprocessor ignores the new message and holds the last valid item of information.



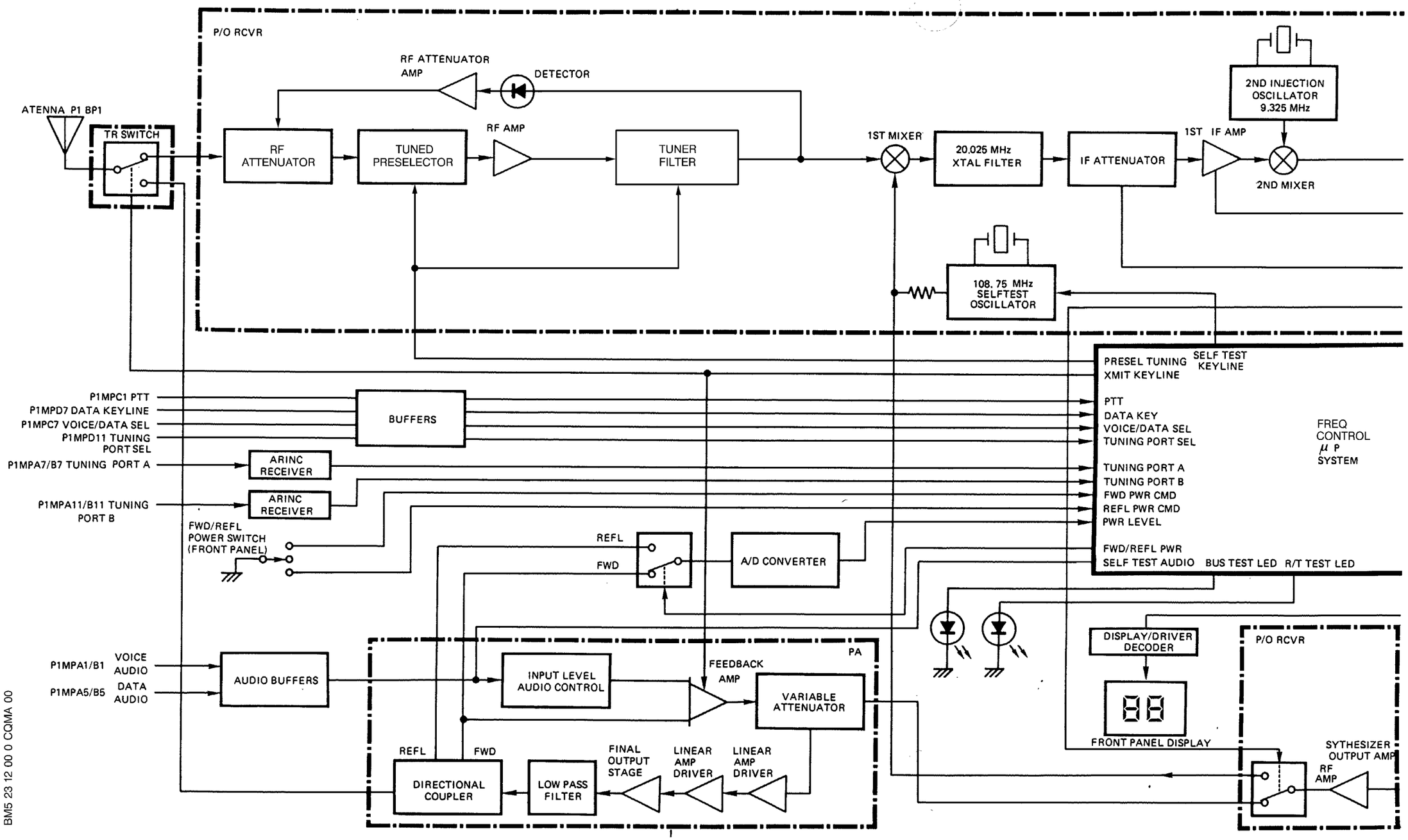

Frequency Synthesizer
Figure 010

R **ON A/C 101-104,

(5)ARINC 429 Message Decoding Circuit
The ARINC 429 bus receivers transform the ARINC 429 message into TTL logic signals which are fed to the microprocessor. After processing, the microprocessor sends information to the synthesizer.
The microprocessor continuously checks the received message.
In the event of a fault, the microprocessor ignores the new message and holds the last valid item of information.

D. Test
After installation, correct operation of the VHF transceiver can be checked by using the following controls located on the transceiver face :
- SQL/LAMP TEST pushbutton switch
When pressing the SQL/LAMP TEST pushbutton switch :
. the squelch is disabled and allows background noise to be heard
. the green LRU PASS and red CONTROL INPUT FAIL annunciator lights come on.
- CONTROL INPUT FAIL and LRU PASS annunciator lights
When pressing the TEST pushbutton switch :
. the green LRU PASS indicator light comes on for 1s approximately to indicate correct operation
. the red CONTROL INPUT FAIL warning light is off
NOTE : The red warning light comes on to indicate control data failure (control unit or bus line).
. the stationary wave ratio appears in the front display.
- RFL/OFF/FWD selector switch
When placing the RFL/OFF/FWD selector switch in FWD and RFL positions, the forward and reflected powers appear respectively in the front display.

(Ref. Fig. 011)




BM5 23 12 00 0 CQMA 00

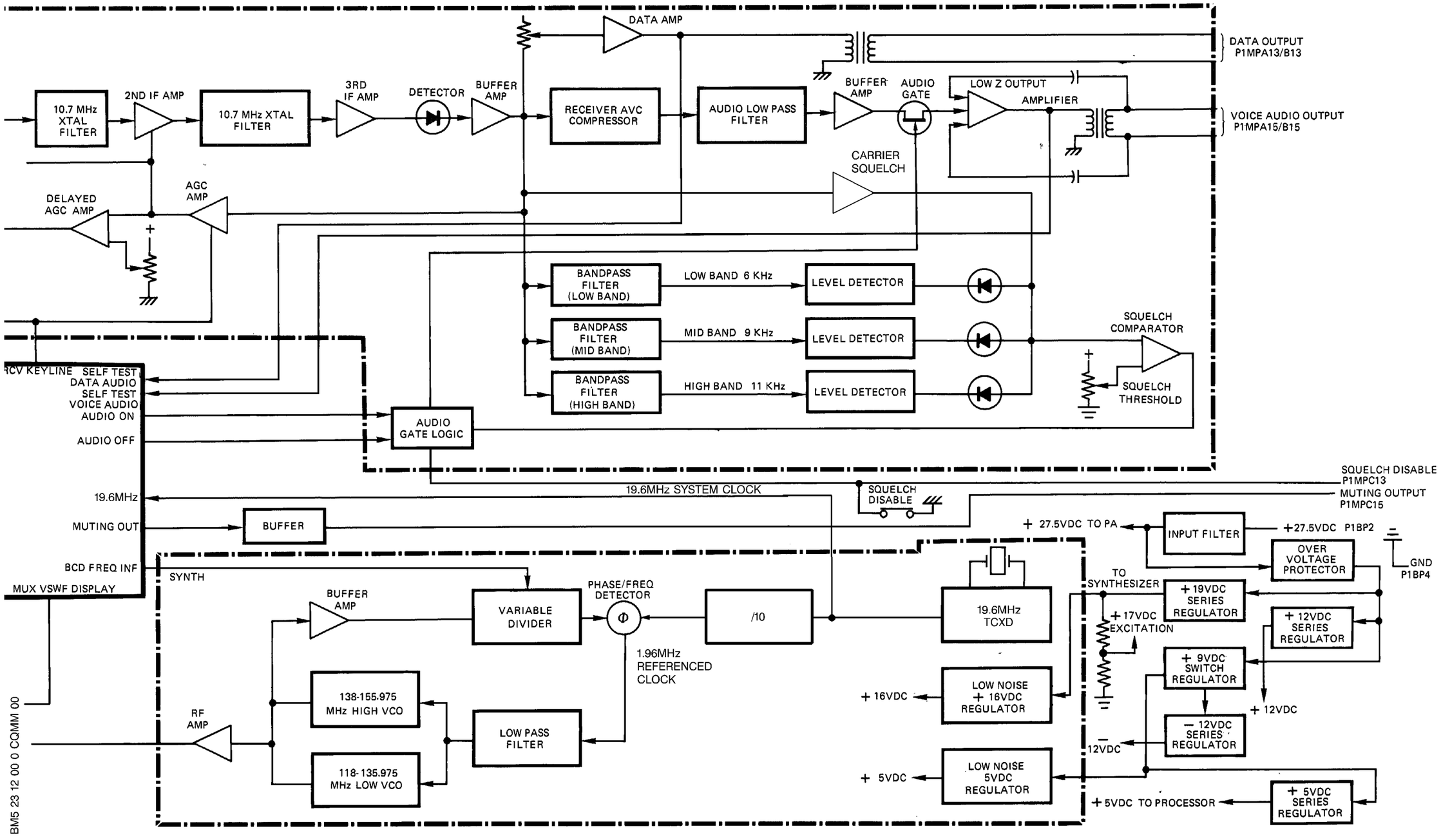
VHF Transceiver - Block Diagram (Sheet 1/2)
Figure 011

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VHF Transceiver - Block Diagram (Sheet 2/2)
Figure 011

## 7. VHF Control Unit

### A. Description

(Ref. Fig. 012)

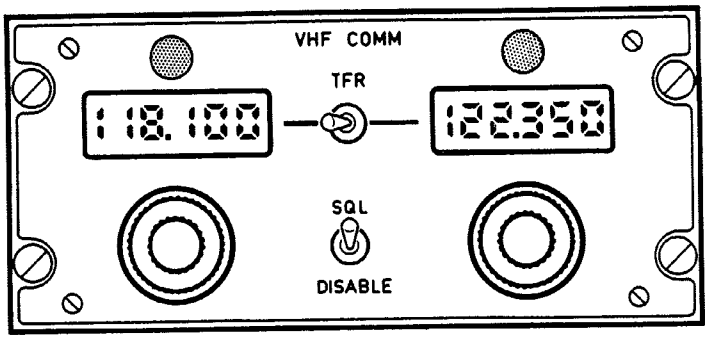
The VHF control unit is a rectangular case in conformity with ARINC 716 specifications.

The face features :

- two frequency displays (liquid crystal displays)
- two green indicator lights
- two sets of two concentric knobs
- a transfer (TFR) switch.
- a squelch disable (SQL/DISABLE) switch

### B. Characteristics

Frequency range : 118 to 136.975 MHz
Channel spacing : 8.33 KHz
Signal output characteristics : ARINC 429
Power requirements : electronic part : 360 mA under 28VDC
lighting part : 390 mA under 5 V/400 Hz
transfer lights : 20 mA per light.
Weight : 2.38 lbs




BM5 23 12 00 0 CDM1 00

VHF Control Unit
Figure 012

C. Utilization
The frequency is selected by rotating the concentric knobs located under the displays independently of the TFR switch position.
The outer knob enables display of high values (tens and units of MHz), the inner knob enables display of small values (tenths and hundredths of MHz).
Thousandths of MHZ are not displayed.
Multiple valves of 8.33 KHz are displayed in the window corresponding to the hundredths of MHz.
The frequency value transmitted to the considered VHF transceiver corresponds to the value displayed in the window selected by means of the TFR switch (white/blue indicator light on). The frequency transfer is obtained by placing the TFR switch in the other position.

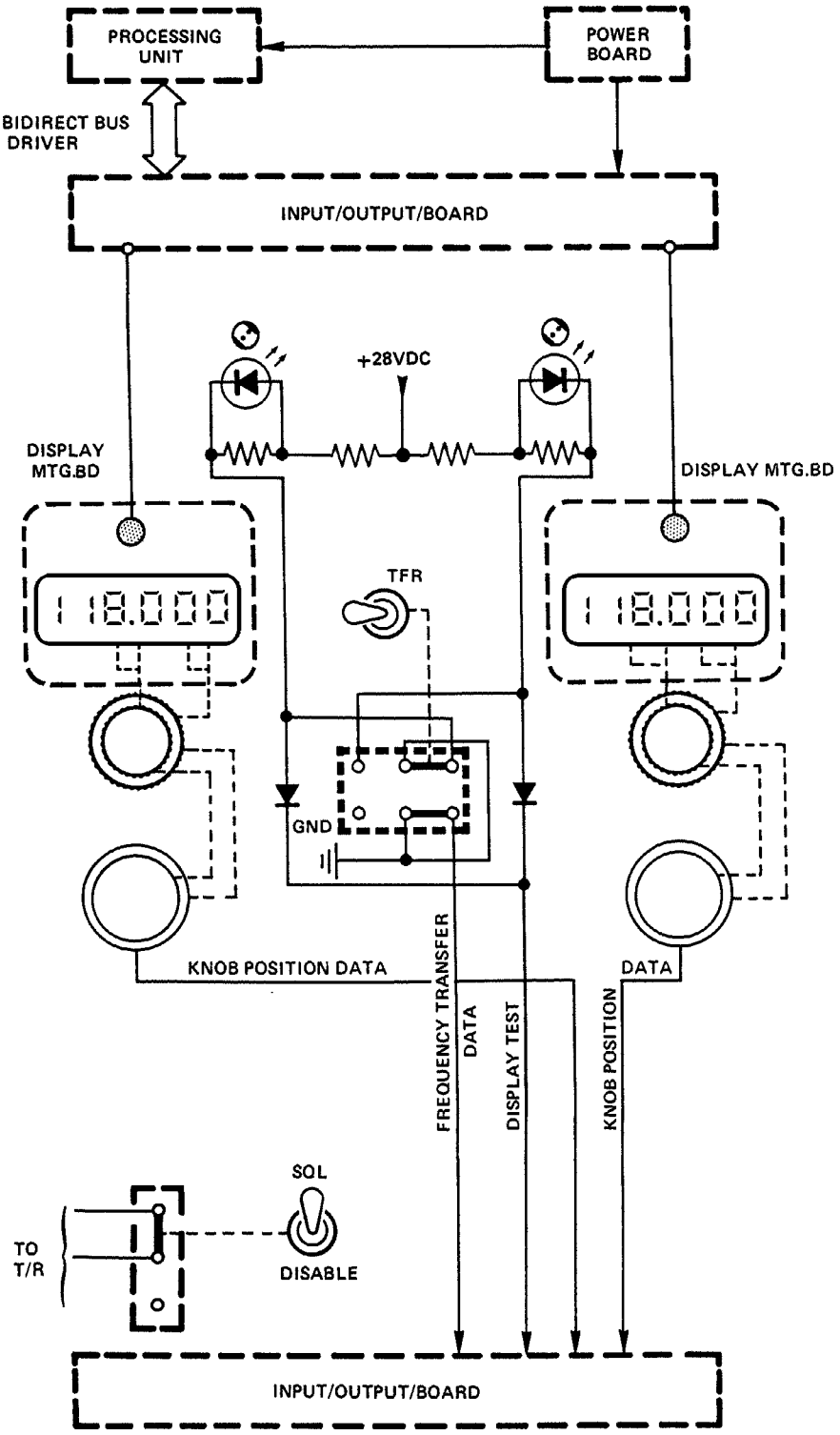
D. Operation
(Ref. Fig. 013)
The frequency data corresponding to the knob position data (the knobs are located under the displays) are fed to two inputs of the dual processor board by means of two encoding devices.
The dual processor board delivers :
- frequency display data to the display driver board
- ARINC 429 output message to the power supply board. This message corresponds to the frequency value in the operating display. The acquisition of either displayed value is controlled by the TFR switch which delivers ground or open circuit data to the processor board.

The display driver board delivers the polarizing voltages necessary to the various segments of the liquid crystal displays for selected frequency value display.
The ARINC 429 frequency display control message from the processor board is sent to the output connector through the power supply board.

E. Display Test
Display and indicator light test is performed by placing the ANN LT switch 6LP (Ref. 33.14) on overhead panel in TEST position. In this case :
- digits display 8
- transfer indicator lights come on.

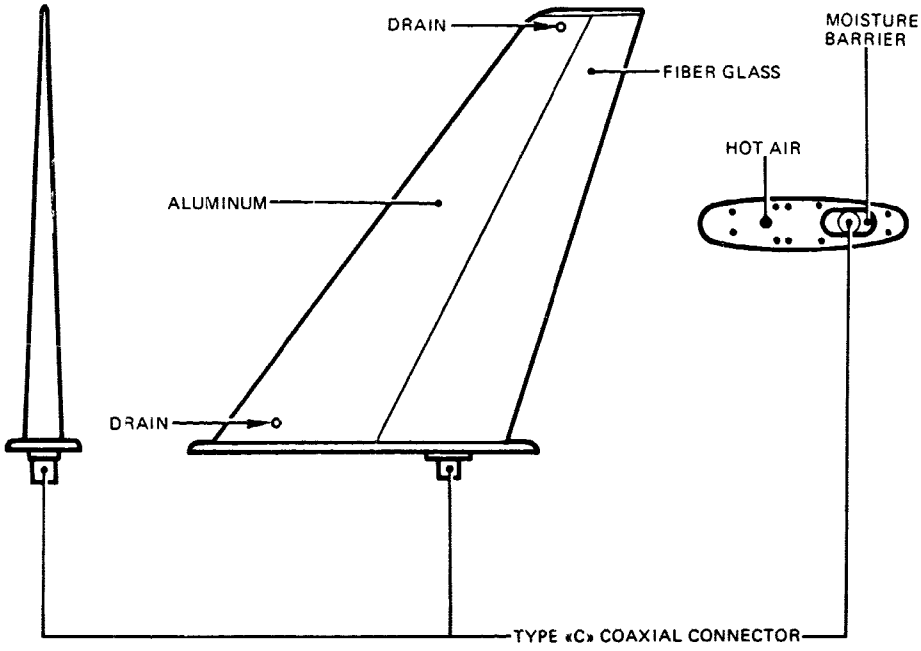
8. VHF Antenna

A. Description (Ref. Fig. 014)
The VHF antenna is a blade antenna.
The front part has a metal leading edge which protects it against erosion and electric discharges.
The rear part is made of fiberglass.
It also includes a heating system (not used on any aircraft).
The antenna is connected to other components by means of a coaxial cable which eliminates radiations and interference inductions.
A C-type coaxial connector isolated by a moisture barrier is located at the lower part of the antenna.
The VHF antenna is screwed on to the fuselage.




BM5 23 12 00 0 CEM1 00

VHF Control Unit - Block Diagram
Figure 013




BM5 23 12 00 0 BEMO

VHF System - Antenna
Figure 014

B. Operation

The VHF antenna, the height of which corresponds to a quarter of the wavelength, provides quasi-omnidirectional radiation.

It is designed to allow transmission and reception of VHF signals over the 116 to 156 MHz frequency range.

Its impedance is 50 ohms and its standing-wave ratio 2.

## VHF SYSTEM - DESCRIPTION AND OPERATION

### 1. General

The Very High Frequency (VHF) system serves for all short-range voice communications between different aircraft in flight, between aircraft in flight or on the ground and ground stations.
The aircraft is equipped with three identical VHF systems which are fully independent.

### 2. Component Location

R **ON A/C 001-100,

(Ref. Fig. 001)

R **ON A/C 105-200,

R (Ref. Fig. 002)

R **ON A/C 001-100, 105-200,

(Ref. Fig. 003)

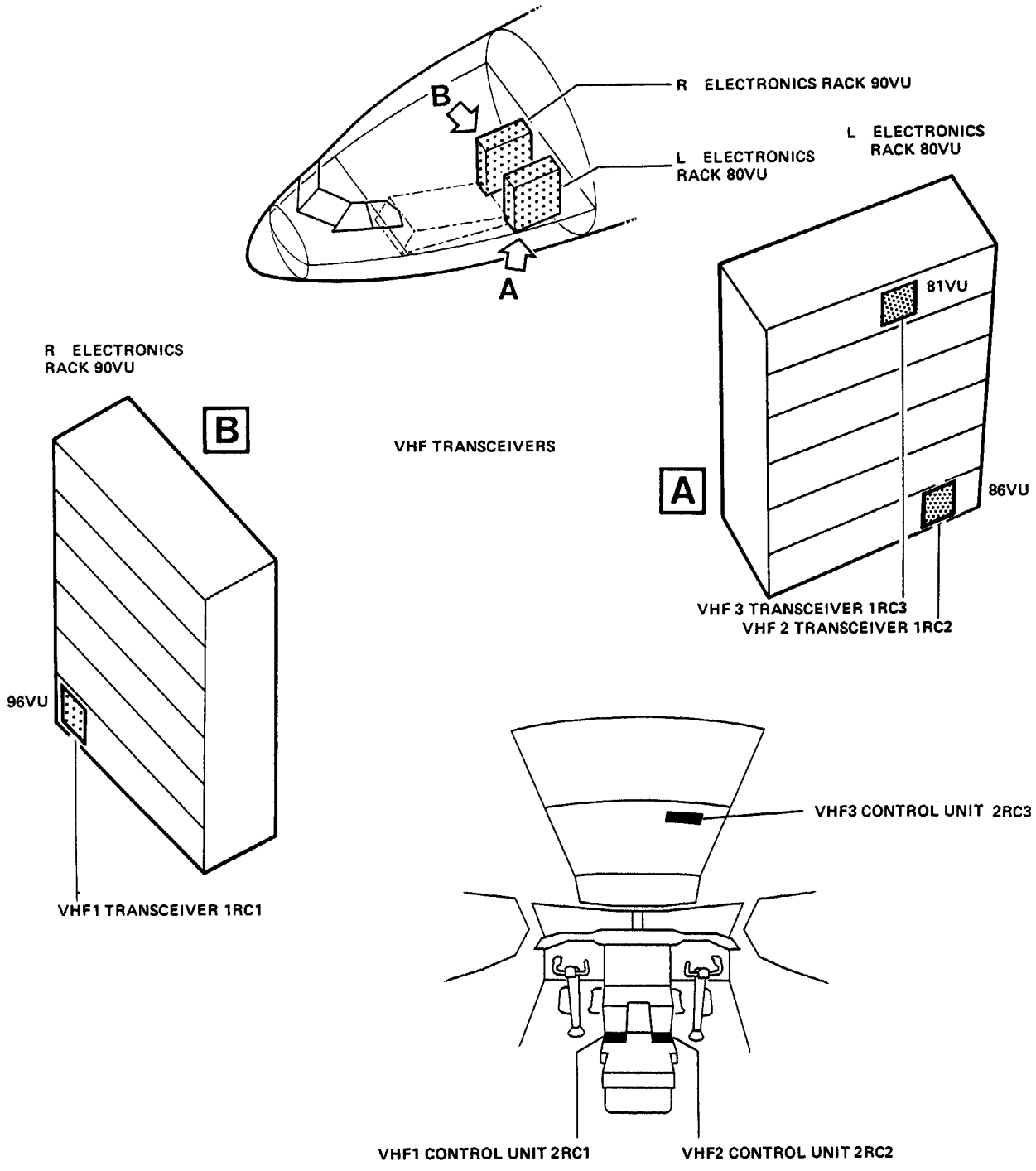
| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 1RC1 | TRANSCEIVER - VHF, 1 | 96VU | 122 | 121 BL | 23-12-33 |
| 1RC2 | TRANSCEIVER - VHF, 2 | 86VU | 121 | 121 BL | 23-12-33 |
| 1RC3 | TRANSCEIVER - VHF, 3 | 81VU | 121 | 121 BL | 23-12-33 |
| 2RC1 | CTL UNIT - VHF, 1 | 11VU | 210 | | 23-12-13 |
| 2RC2 | CTL UNIT - VHF, 2 | 11VU | 210 | | 23-12-13 |
| 2RC3 | CONTROL UNIT - VHF, 3 | 20VU | 210 | | 23-12-13 |
| 3RC1 | ANTENNA - VHF, 1 | | 230 | | 23-12-11 |
| 3RC2 | ANTENNA - VHF, 2 | | 154 | | 23-12-11 |
| 3RC3 | ANTENNA - VHF, 3 | | 240 | | 23-12-11 |

R **ON A/C 001-100,

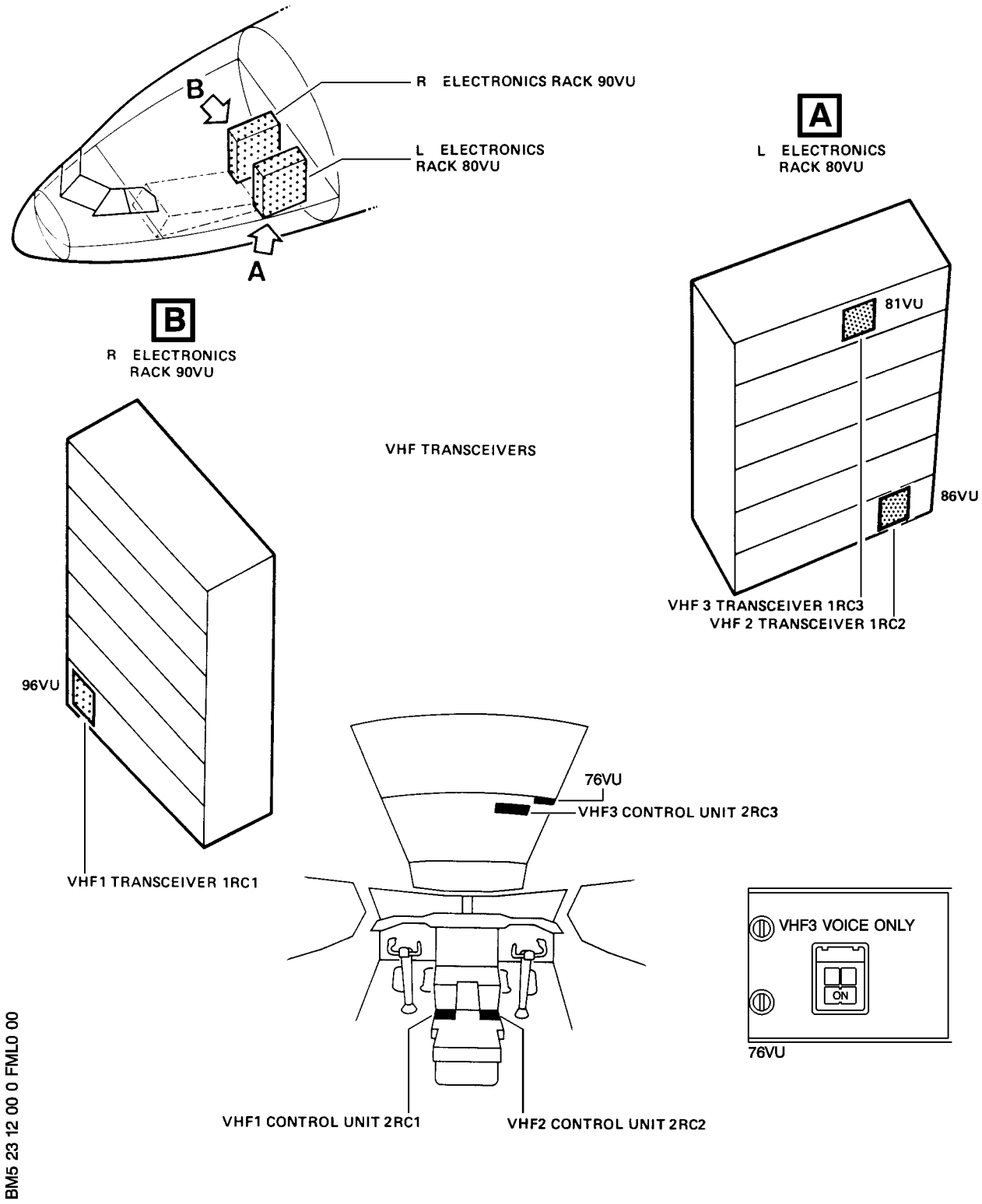
### 3. System Description

Each system consists of :
- a VHF transceiver
- a VHF control unit
- a VHF antenna

Both systems are associated with the audio integrating system and SELCAL system. The control units are connected to a general test circuit for display test. The VHF3 system is connected to a provision for installation of an ACARS (ARINC Communications Addressing and Reporting System).

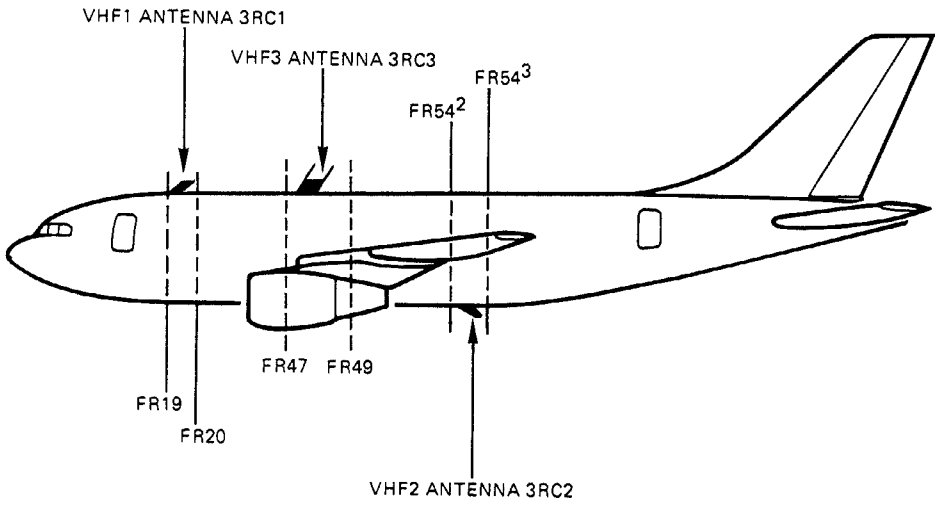



VHF System - Component Location
Figure 001




BM5 23 12 00 0 FML0 00

VHF System - Component Location
Figure 002




BM5 23 12 00 0 ACM3.00

VHF System - Antenna Location
Figure 003

**ON A/C 105-200,

3. System Description
VHF1 and VHF2 systems consist of :
- a VHF transceiver
- a VHF control unit
- a VHF antenna.
VHF3 system consists of :
- a VHF transceiver
- a VHF antenna
and is connected with the ACARS system.
All systems are associated with the audio integrating and the SELCAL systems.

**ON A/C 001-100, 105-200,

4. Electrical Power Supply

A. VHF1 System

R

(Ref. Fig. 004)

R

(Ref. Fig. 005)

**ON A/C 001-100,

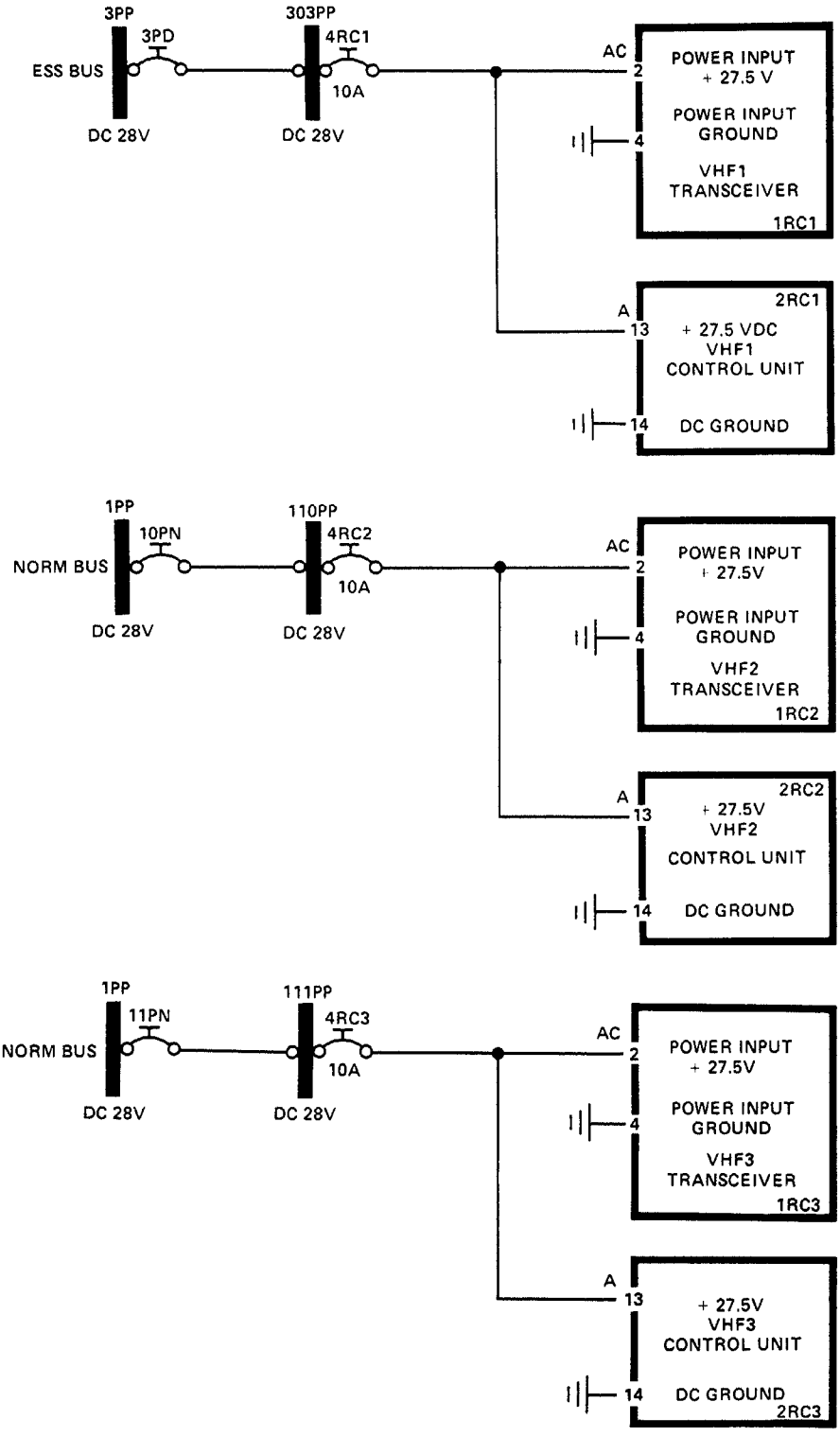
The VHF1 system is supplied with 28VDC from ultimate emergency busbar 3PP via busbar 303PP through 10A MIN EQPT BAY SUPPLY circuit breaker 4RC1 located on circuit breaker panel 22VU.

B. VHF2 System (Ref. Fig. 004)
The VHF2 system is supplied with 28VDC from Normal busbar 1PP via busbar 110PP through 10A circuit breaker 4RC2 located on circuit breaker panel 21VU.

C. VHF3 System (Ref. Fig. 004)
The VHF3 system is supplied with 28VDC from Normal busbar 1PP via busbar 111PP through 10A circuit breaker 4RC3 located on circuit breaker panel 21VU.

**ON A/C 105-200,

The VHF1 system is supplied with 28VDC from ultimate emergency busbar 3PP via busbar 303PP through 10A MIN EQPT BAY SUPPLY circuit breaker 4RC1 located on circuit breaker panel 22VU.




BM5 23 12 00 0 AGM3·00

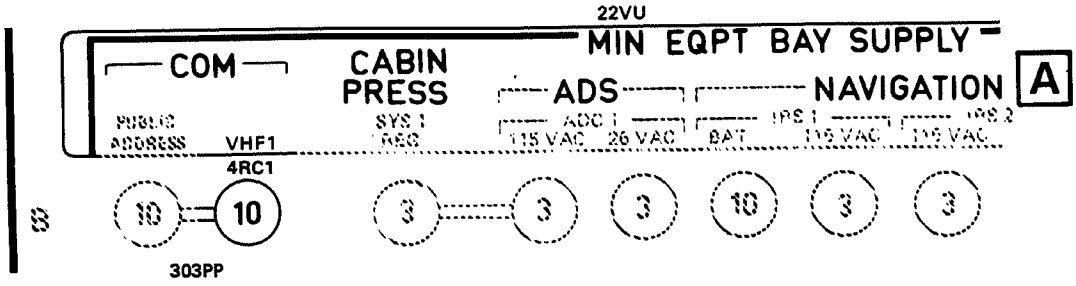
VHF System - Electrical Power Supply
Figure 004

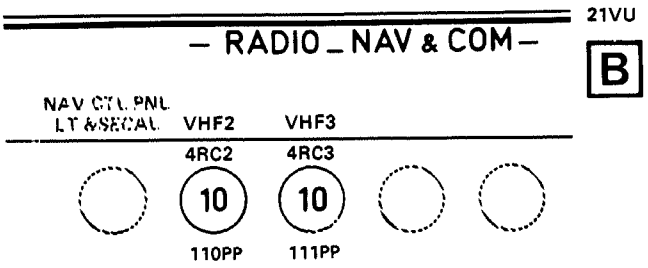
R EFFECTIVITY: 001-100, 105-200,

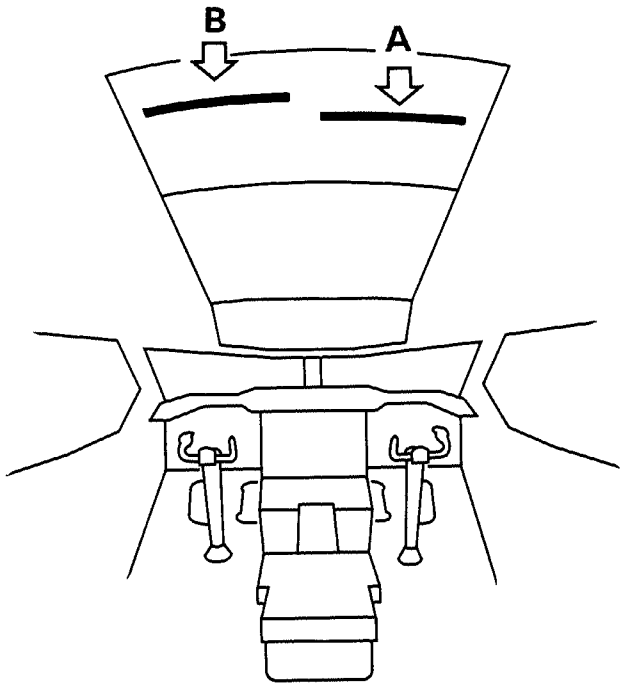
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Circuit Breaker Location
Figure 005

B. VHF2 System (Ref. Fig. , 005)
The VHF2 system is supplied with 28VDC from Normal busbar 1PP via busbar 110PP through 10A circuit breaker 4RC2 located on circuit breaker panel 21VU.

C. VHF3 System (Ref. Fig. , 005)
The VHF3 system is supplied with 28VDC from Normal busbar 1PP via busbar 111PP through 10A circuit breaker 4RC3 located on circuit breaker panel 21VU.

**ON A/C 001-100, 105-200,

5. Operation

**ON A/C 001-100,

(Ref. Fig. 006)

**ON A/C 105-200,

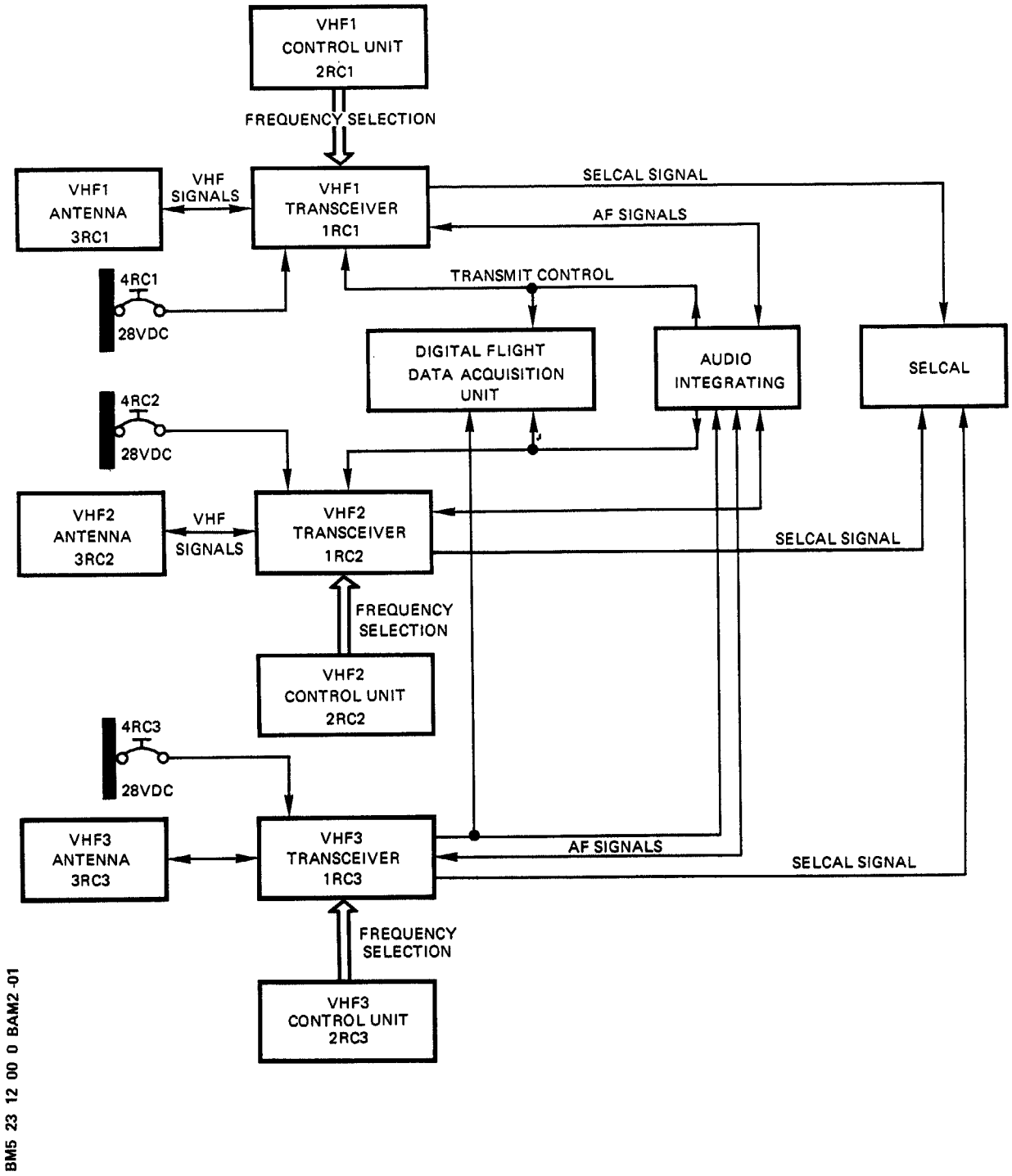
(Ref. Fig. 007)

**ON A/C 001-100,

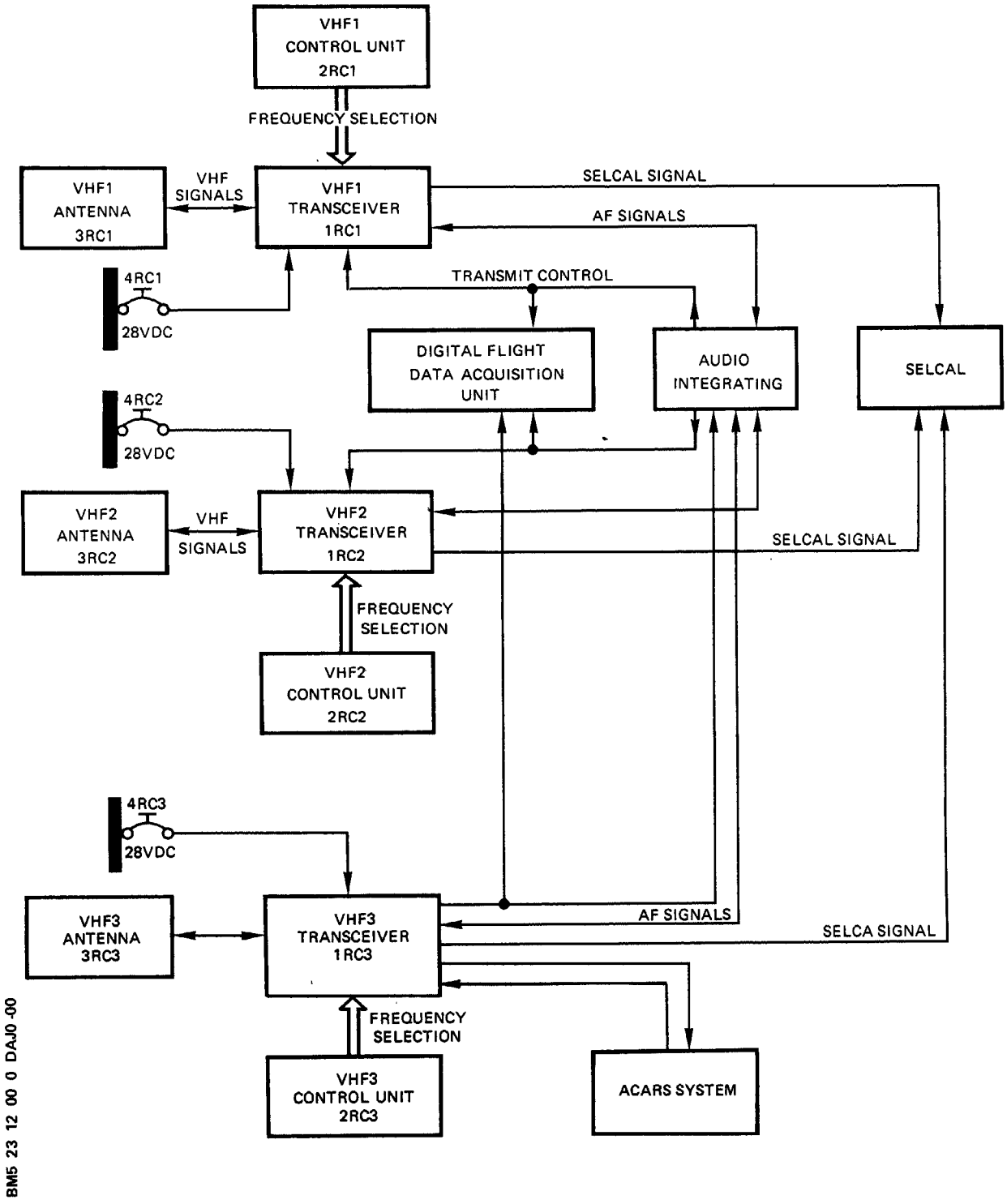
A. Receive Mode
The VHF radio communication signals transmitted by the antennas are received by the aircraft antenna and then transmitted to the VHF transceiver.
The VHF transceiver which is tuned to the frequency selected on the control unit, converts received VHF signals into AF signals. These signals are sent to acoustic equipment via the audio integrating system (Ref. 23-50) and SELCAL decoder (Ref. 23-22).

B. Transmit Mode
The AF signals from various microphones are transmitted to the VHF transceiver via the audio integrating system.
The VHF transceiver which is tuned to the frequency selected on the control unit, converts AF signals into VHF signals. These signals are transmitted to the antennas by coaxial connections.

6. Associated Peripheral Systems
The VHF systems are connected with :
- the audio integrating system
- the SELCAL system
- the DFDAU (digital flight data acquisition unit)
- a system provision for installation of an ACARS (VHF3 only).




VHF System - Block Diagram
Figure 006




VHF System - Block Diagram
Figure 007

R EFFECTIVITY: 105-200,

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**ON A/C 105-200,

A. Receive Mode
The VHF radio communication signals transmitted by the antennas are received by the aircraft antenna and then transmitted to the VHF transceiver.
The VHF transceiver which is tuned to the frequency selected on the control unit for the VHF1 and VHF2 systems, selected on the ACARS CDU for the VHF3 system, converts received VHF signals into AF signals. These signals are sent to acoustic equipment via the audio integrating system (Ref. 23-50) and SELCAL decoder (Ref. 23-22).

B. Transmit Mode
The AF signals from various microphones are transmitted to the VHF transceiver via the audio integrating system.
The VHF transceiver which is tuned to the frequency selected on the control unit for the VHF1 and VHF2 systems, selected on the ACARS CDU for the VHF3 system, converts AF signals into VHF signals. These signals are transmitted to the antennas by coaxial connections.

6. Associated Peripheral Systems
The VHF systems are connected with :
- the audio integrating system
- the SELCAL system
- the DFDAU (digital flight data acquisition unit)
- the ACARS system (VHF3 only).

7. VHF Transceiver

A. Description
The communications transceiver conforms to ARINC characteristic 716.
Its case size is 3 MCU, in compliance with ARINC 600 standards.
(1)VHF transceiver face
The face features :
- two jacks (PHONE and MIC)
- a TEST pushbutton switch to check system for correct operation
- a green LRU PASS indicator light
- a red CONTROL INPUT FAIL warning light
- a SQL/LAMP TEST pushbutton switch
- a forward/reflected power display with associated RFL/OFF/FWD selector switch
- a carrying handle
- an identification plate.

**ON A/C 001-100,

7. VHF Transceiver

A. Description

The VHF communications transceiver conforms to ARINC characteristic 716. Its case size is 3 MCU, in compliance with ARINC 600 standards.

(1) VHF transceiver face

The face features :

- two jacks (PHONE and MIC)
- a SQ/TEST pushbutton switch to check the system for correct operation
- a green COM PASS indicator light
- a red COM FAIL warning light
- a red DATA IN FAIL warning light
- a carrying handle
- an identification plate.

(Ref. Fig. 008)

**ON A/C 105-200,

(Ref. Fig. 009)

**ON A/C 001-100,

(2)VHF transceiver back
The back is equipped with three connectors to enable :
- connection with power supply and antenna circuits (BP)
- connection with peripheral circuits (control unit, audio integrating, etc. MP)
- connection with an ATE (automatic test equipment) system (TP).

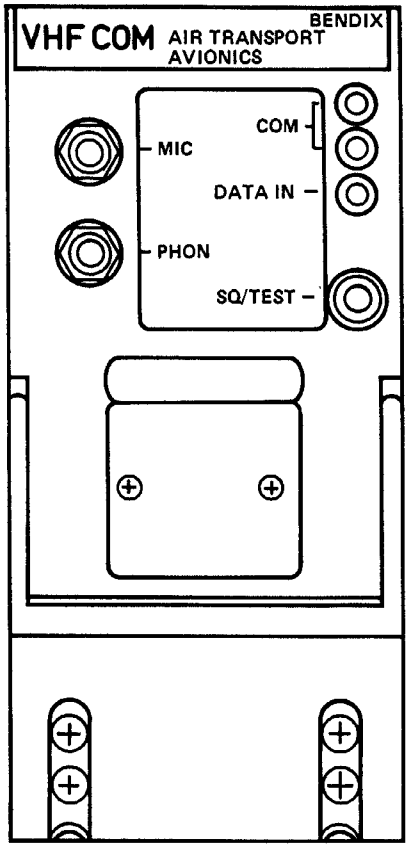
B. Characteristics
The VHF transceiver complies with the standards defined in ARINC 716 and 600.
It enables transmission and reception of :
- radio communication phonic messages through electroacoustic equipment (headset, hand microphone, boomset and loudspeaker)
- coded messages in keeping with ARINC 429.

The VHF transceiver operates in the 118.000 to 137.975 MHz frequency range in 800 channels spaced by 25 KHz.
Its main characteristics are :

| | |
|---|---|
| (1)Transmitter | |
| Output power | 25 W minimum |
| Antenna impedance | 50 ohms |
| (2)Receiver | |
| Output power | 50 mW minimum into a 200 to 600 ohms |
| Sensitivity | 2 $\mu$V for 6 dB (s + n)/n |
| Selectivity | 6 dB at ±8 KHz<br>60 dB at ±17 Hz |
| (3)Power Supply | |
| Voltage | 27.5 VDC (+10%, -20%) |
| Current | 1A, receive mode<br>5.5A, transmit mode |

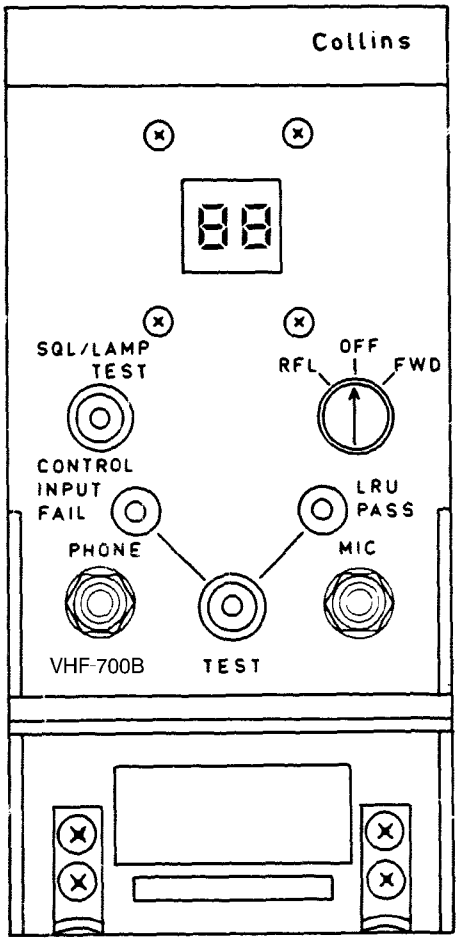
C. Operation
(1)Power supply
The aircraft power (pin 2, connector BP) is applied to the power transmitting circuit through an input filter. At the output, a switching regulator circuit provides five regulated DC voltages (+ 5 V, + 5.25 V, + 8 V, + 12 V and + 15 V) required for operation of the various parts of the equipment. + 10.3 volts used at receiver module, is given by a zener diode from regulated + 15 volts.

**ON A/C 105-200,




BM5 23 12 00 0 CAM0 16

VHF Transceiver Face
Figure 008




BM5 23 12 00 0 CWM0 00

VHF Transceiver Face
Figure 009

(2)VHF transceiver back

The back is equipped with three connectors to enable :

- connection with power supply and antenna circuits (BP)
- connection with peripheral circuits (control unit, audio integrating, etc. MP)
- connection with an ATE (automatic test equipment) system (TP).

B. Characteristics

The VHF transceiver complies with the standards defined in ARINC 716 and 600.

It enables transmission and reception of :

- radio communication phonic messages through electroacoustic equipment (headset, hand microphone, boomset and loudspeaker)
- coded messages in keeping with ARINC 429.

The VHF transceiver operates in the 118.000 to 136.975 MHz frequency range in 2278 channels spaced by 8.33 KHz.

Its main characteristics are :

(1)Transmitter

| | |
|---|---|
| Output power | 25 W minimum |
| Antenna impedance | 50 ohms |

(2)Receiver

| | |
|---|---|
| Output power | $\geq$ 50 mW into 600 ohms |
| Sensitivity | 2 $\mu$V for 6 dB (s + n)/n |
| Selectivity | 6 dB at ±8 KHz<br>60 dB at ±17 KHz |

(3)Power Supply

| | |
|---|---|
| Voltage | 27.5 ±0.5VDC |
| Current | 1.3A, receive mode<br>7.6A, transmit mode |

C. Operation

(1)Power supply (Ref. Fig. 010)

The aircraft power (pin 2, connector BP) is applied to the power transmitting circuit and to an overvoltage protection circuit through an input filter. At the output, a switching regulator circuit provides six regulated dc voltages (+9 V, +5 V, -12 V, +12 V, +17 V and +19 V) required for operation of the various parts of the equipment.
The synthesizer contains regulating circuits (+16 V, +5 V) from voltages (+19 V, +9 V) delivered by the main power supply circuits.

**ON A/C 001-100,

(Ref. Fig. 011)

**ON A/C 001-100, 105-200,

(2)Receiver

**ON A/C 001-100,

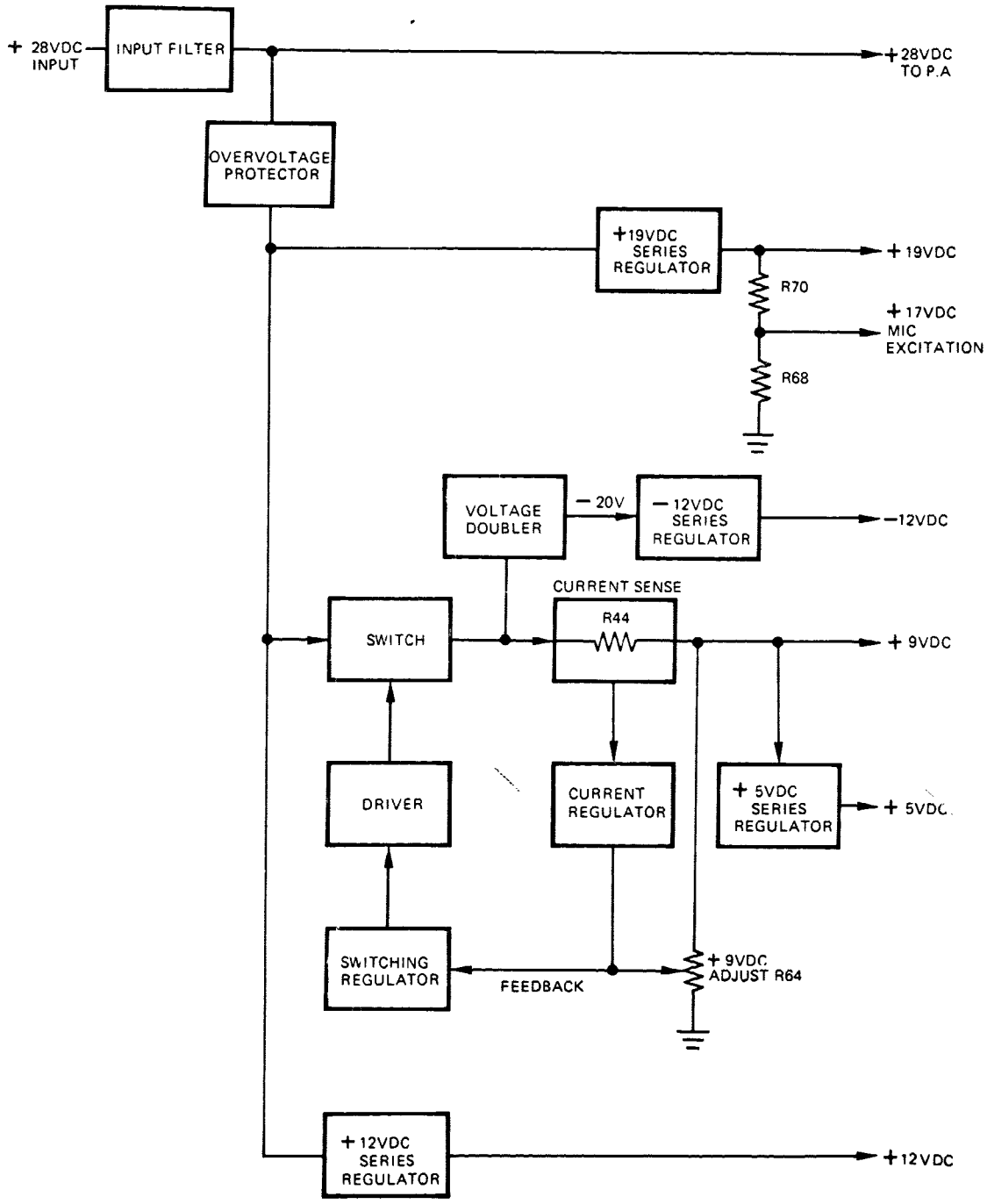
(Ref. Fig. 012)

**ON A/C 105-200,

(Ref. Fig. 013)

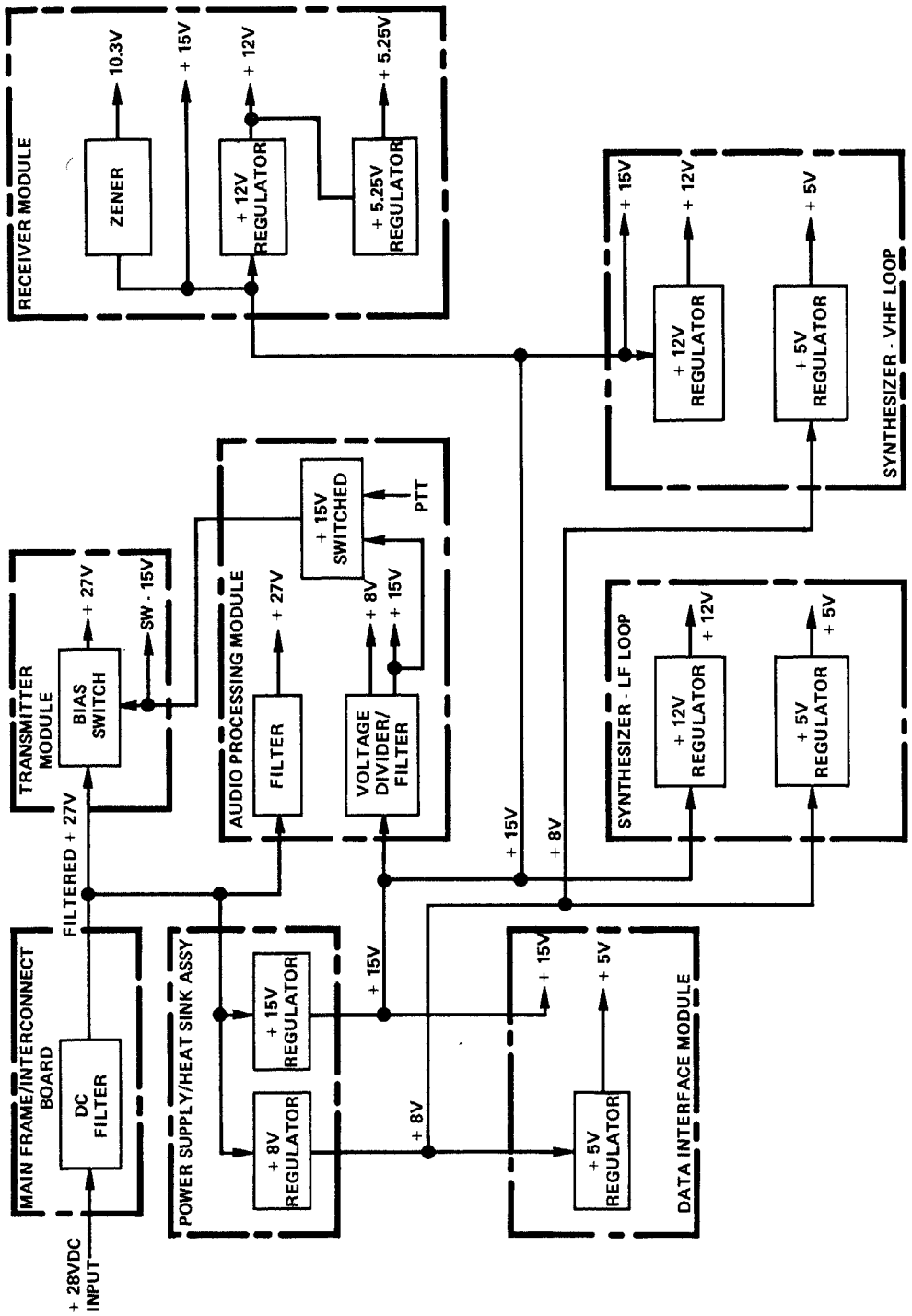
**ON A/C 001-100,

In receive mode, the incoming modulated RF signal from the antenna is routed to an input attenuator by the solid-state antenna switch.
The attenuator driver is controlled by delayed AGC and feedback through the RF detector. From the attenuator, the RF signal is fed to the preselector filter, which rejects receiver image frequencies and other undesired spurious frequencies.
The DC tuning voltage, which is controlled by the microcomputer, is amplified by the tuning voltage amplifier. This DC voltage tunes the preselector so that the center of its passband is at the selected channel frequency. The output from the preselector is combined with the synthesizer output in the mixer to produce the IF signal of 21.4 MHz. The mixer uses n-channel FET devices to convert the signal for application to the 21.4 MHz crystal filter. This filter provides some of the selectivity in the receiver. The output from the 21.4 MHz crystal filter is fed to the first IF amplifier which applies its amplifier output to the final IF amplifier. However, much of the incoming noise is also amplified.
Most of this noise is filtered by the 21.4 MHz final filter, which has a bandwidth at 6dB of ±10KHz. This filter, in conjunction with the first filter, provides the total receiver selectivity. The output of the final filter is applied to the AM detector. The detector amplifier amplifies the detect audio envelope. The DC component of the detected audio is filtered by the RC low-pass filter and applied to the AGC amplifier to




BM5 23 12 00 0 BJMO

VHF System - Power Supply
Figure 010



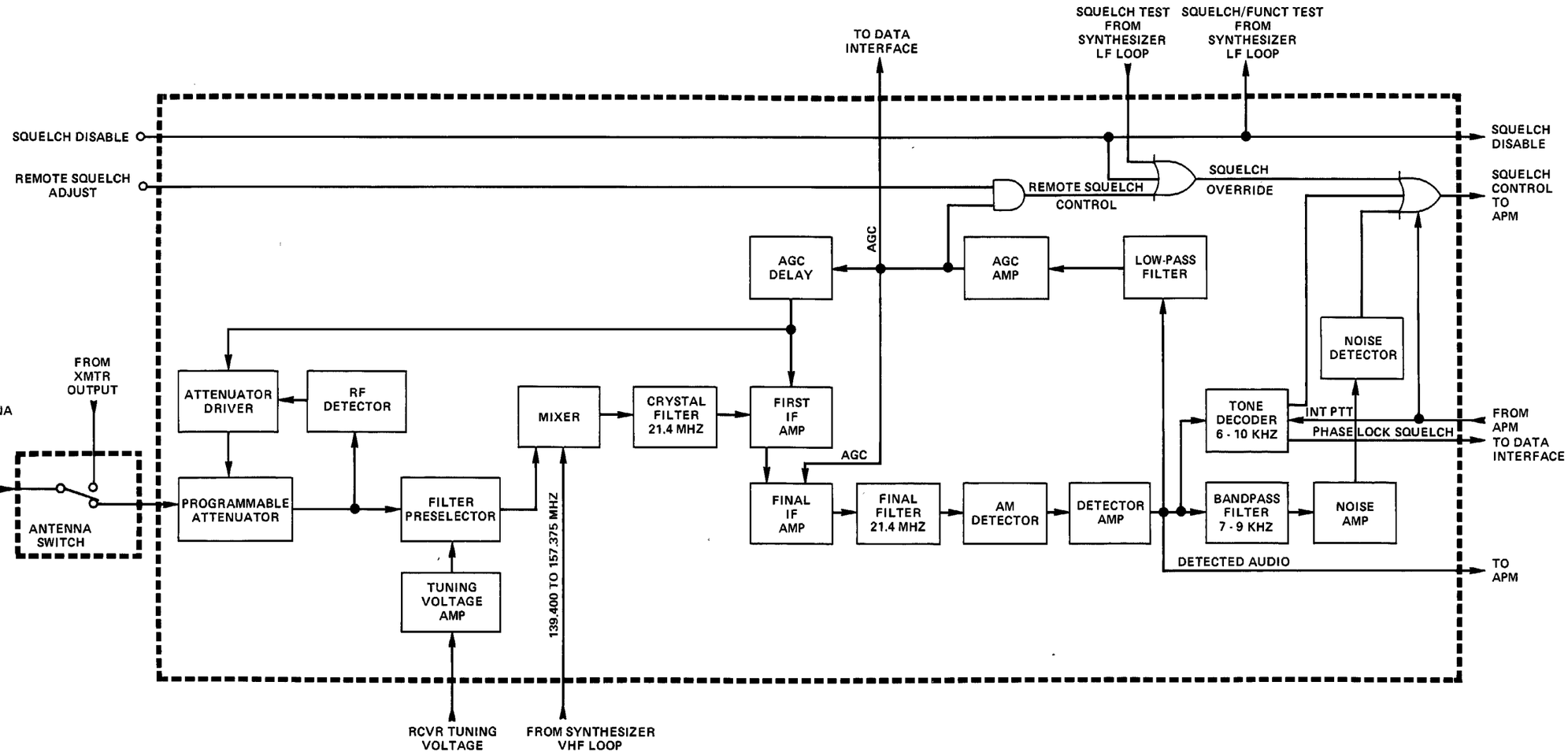

BM5 23 12 00 0 CBM0-16

VHF System - Power Supply
Figure 011

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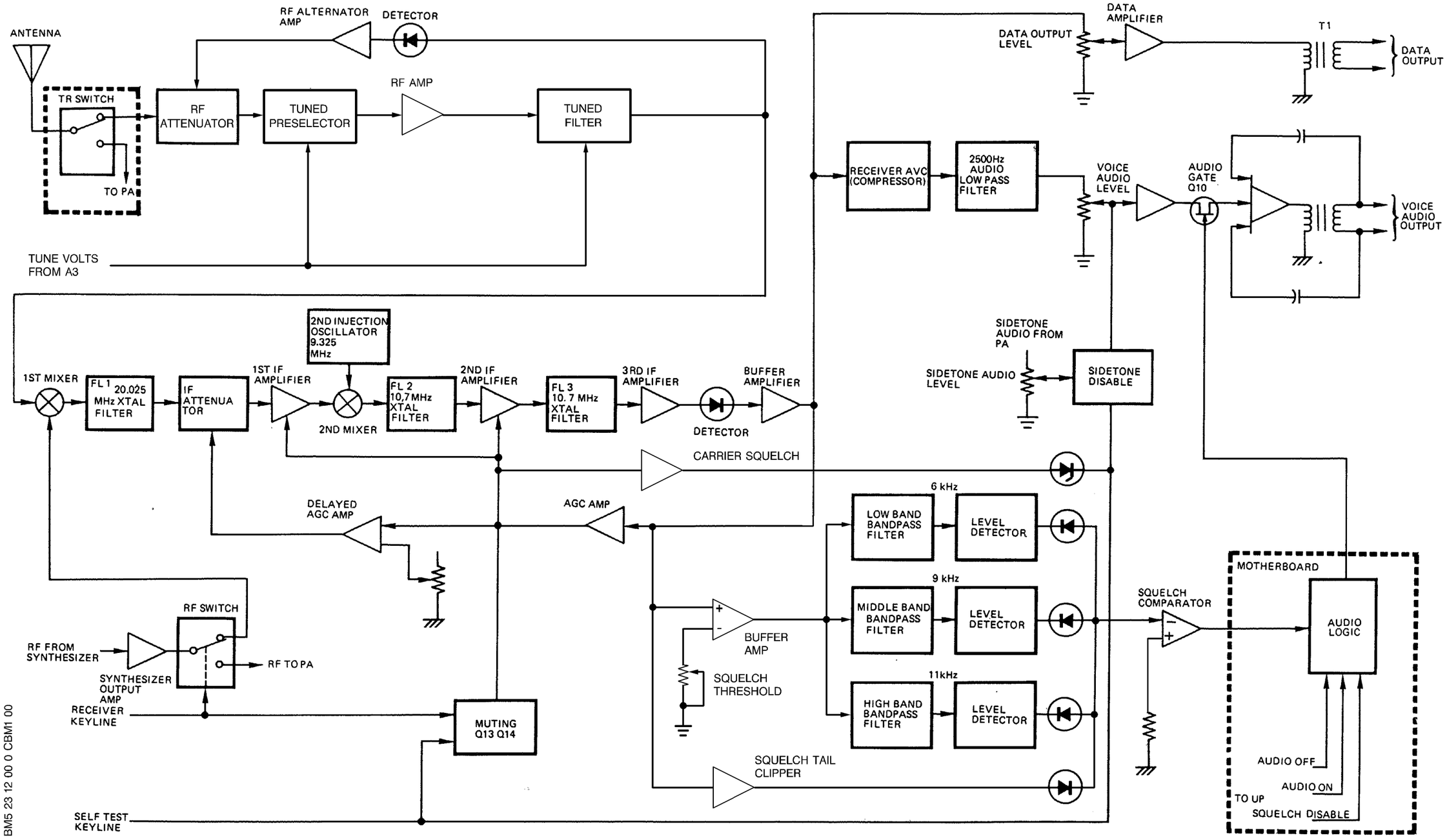


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Receiver
Figure 012




BM5 23 12 00 0 CBM1 00

Receiver
Figure 013

develop the AGC for the receiver.
The AGC output controls the gain of the final IF amplifier, it is also applied to the AGC delay circuit, which starts to develop secondary AGC when the input signal level reaches about 200 $\mu$V.
This secondary AGC controls the gain of the first IF amplifier and through the attenuator driver, provides attenuation to high-level signals by means of the attenuator. The detected audio output from the detector amplifier is fed to the bandpass filter which has a bandwidth at 3dB (7 to 9 KHz). Filtered audio signal is amplified and applied to a noise detector. With an increasing RF signal, the noise level of the receiver decreases due to the AGC action of the receiver. At the squelch threshold, the noise detector provides an output through the squelch control or gate to open the squelch at the audio processing module.
The output from the detector amplifier is also applied to the tone decoder. It opens the squelch when a valid multi-carrier (CLIMAX) signal is received. The tone decoder has a capture range of about 6 to 10KHz, which overlaps the filter passband (7 to 9 KHz), of the noise squelch circuit. A valid CLIMAX-type tone will be recognized as a fixed frequency, and a phase-lock detect output will be applied through the squelch control OR gate to open the squelch at the audio processing module.
The remote squelch control circuit allows the connection of a remote squelch control potentiometer if desired. The remote control can be adjusted to set the desired squelch level applying a DC reference voltage to one input of the AND gate. The second input is the AGC. As the AGC rises to a level above the reference voltage, the remote squelch control circuit applies an output through the squelch override and squelch control gates to open the squelch.
The squelch override circuit also opens the squelch in the same way if the squelch is disabled at the R/T front panel, by a remote squelch disable input, or by a squelch test signal from the synthesizer (under microcomputer control).
The squelch control OR gate is disabled (inhibiting squelch opening) during transmit by the INT PTT output from the audio processing module. This signal is also applied to the tone decoder to inhibit operation of this circuit.

(3)Transmitter
Modulation from the audio processing module is applied to the modulator. Transmitter RF drive from the synthesizer is applied through the preamplifier to the predriver, where the audio modulation is added to the RF carrier.
This signal is passed through the variable attenuator, driver amplifier, and final power amplifier and out of the transmitter to the final filter.
The output from the final amplifier is fed back through the VSWR detector and VSWR amplifier to the variable attenuator to provide automatic gain control.
This feedback adjusts the variable attenuator to provide nearly constant transmitter power output throughout the operating frequency band.
The DC voltage level output from VSWR amplifier drives the variable attenuator. The switched +15 volts is applied to the bias switch, preamplifier, modulator and VSWR amplifier only in the transmit mode. The driver switch, when switched on, applied +27 volts to operate the driver



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amplifier and final amplifier.
When the transmitter is keyed, a sidetone enable signal is fed to the audio processing module. The final filter removes harmonics of the fundamental frequency and directs the RF energy to the antenna, via the antenna switch.

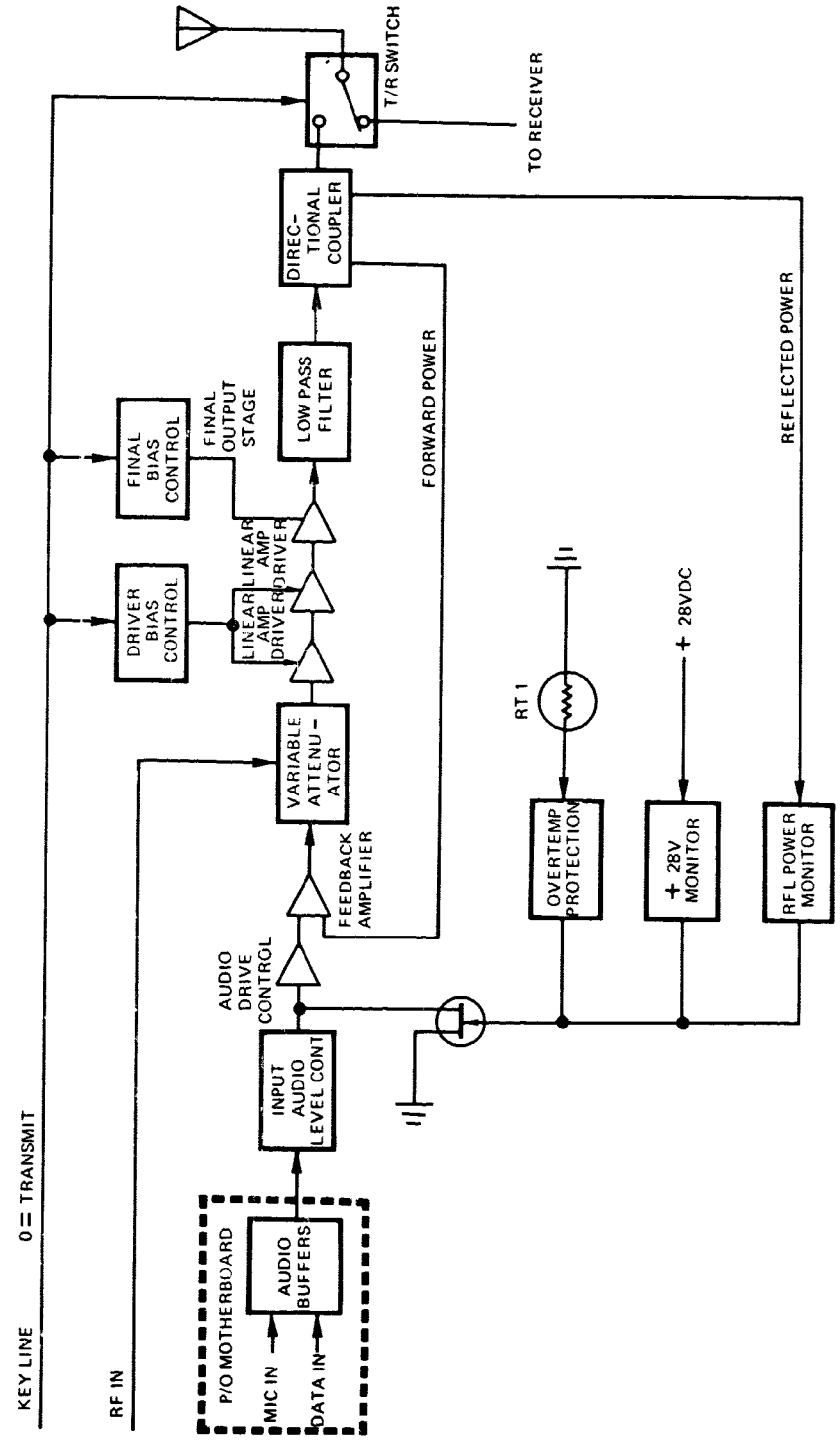
**ON A/C 105-200,

In receive mode, the incoming modulated RF signal from the antenna is routed to an input attenuator by the solid-state antenna switch.
The attenuator driver is controlled by delayed AGC and feedback through the RF detector.
The output signal of the preselector is fed through an RF attenuator to a high-level, low-noise amplifier providing a gain of 12 dB.
A portion of the amplifier output is used to drive the attenuator which adjusts the amplifier input level and maintains it constant. The amplifier output signal is then applied to one of two low-pass filters.
Selection of the low band or high band filter is made depending on the received frequency (118 to 127.975 MHz or 128 to 136.975 MHz). These filters prevent the undesired frequencies from being fed back to the antenna. They also filter out image frequency signals that may appear above the desired frequency.
After filtering, the signal is applied to a first mixer where it is mixed with the signal from the frequency synthesizer of following F value :
F = F of received signal + 20.025 MHz to create a first intermediate frequency of 20.025 MHz.
This first IF output is then filtered by a crystal filter and amplified (40 dB of gain depending on AGC).
If the amplifier input signal exceeds 700 $\mu$V, an attenuator is activated by the AGC circuit to prevent overload of the amplifier.
The signal is then applied to a second mixer. This mixer receives the modulated 20.025 MHz signal and a 9.325 MHz frequency signal produced by a crystal oscillator.
The output provides a second IF signal of 10.7 MHz.
This second IF signal is filtered and amplified twice before detection.
Both IF amplifiers provide a gain of 70 dB.
The complete amplification channel provides a total gain of 110 dB.
The modulated signal is then applied to a detection circuit and to a buffer amplifier. This detection circuit also controls the AGC circuit which controls the IF amplifier gain and the delayed AGC circuit. The latter controls the first IF signal attenuator and limits the amplifier input signal at 700 $\mu$V.
The buffer amplifier output demodulated signal is applied to the data circuit, audio circuit and squelch circuit.
As far as data circuit is concerned, the signal is amplified and applied to a transformer which provides an adjustable output voltage.
For the audio circuit, the demodulated signal is applied to a compressor (automatic volume control : AVC) to maintain a constant audio output level.

The compressor output signal is applied to a low pass filter comprising three stages, which eliminates all the frequencies greater than 2.5 KHz and lower than 300 Hz. The signal is then amplified and is fed through an AF control circuit (audio gate) activated by the squelch circuit.
It is amplified again and applied to the output amplifier which provides an output power comprised between 0.5 and 50 mW into 600 ohms.
A feedback circuit reduces distortions in the final amplifier and enables the receiver to be connected to an open or short circuit without damage.
For the squelch circuit, the demodulated signal from the buffer amplifier is applied to three circuits consisting of bandpass filters and level detectors. The bandpass filters are identical but centered on different frequencies : 6, 9 and 11 KHz.
These frequencies were selected so that transmissions in offset carrier (CLIMAX network) are not processed as noise.
Reception of a signal on at least one of these frequencies reduces the received noise through these filters and level detector which results in improving the signal-to-noise ratio.
The level detector(s) detect the ratio variation and activate the squelch comparator which controls the audio frequency gate through a logic circuit and as a function of its adjustment threshold.

(3)Transmitter (Ref. Fig. 014)

The signal from the microphone or data circuit is applied through a buffer amplifier to a low-pass filter and compressor. The compressor maintains a constant modulation percentage (90%) regardless of the audio input level.
The output signal is sent to an audio drive control circuit. This circuit checks the transmitter output final power depending on : the final stage temperature, the reflected power and the 28 V power supply.
The audio signal is then sent to one input of the feedback amplifier which receives the output transmitted signal on another input (transmitted power).
These two signals are compared in the amplifier which delivers a linear output signal.
The amplifier output is applied to one input of a variable attenuator which receives the VHF signal from the frequency synthesizer on the other input.
The VHF signal is modulated in amplitude after it has been fed into the variable attenuator by the regulated audio signal.
This signal is then amplified, filtered and sent to the antenna via a static relay.




BM5 23 12 00 0 BNMO

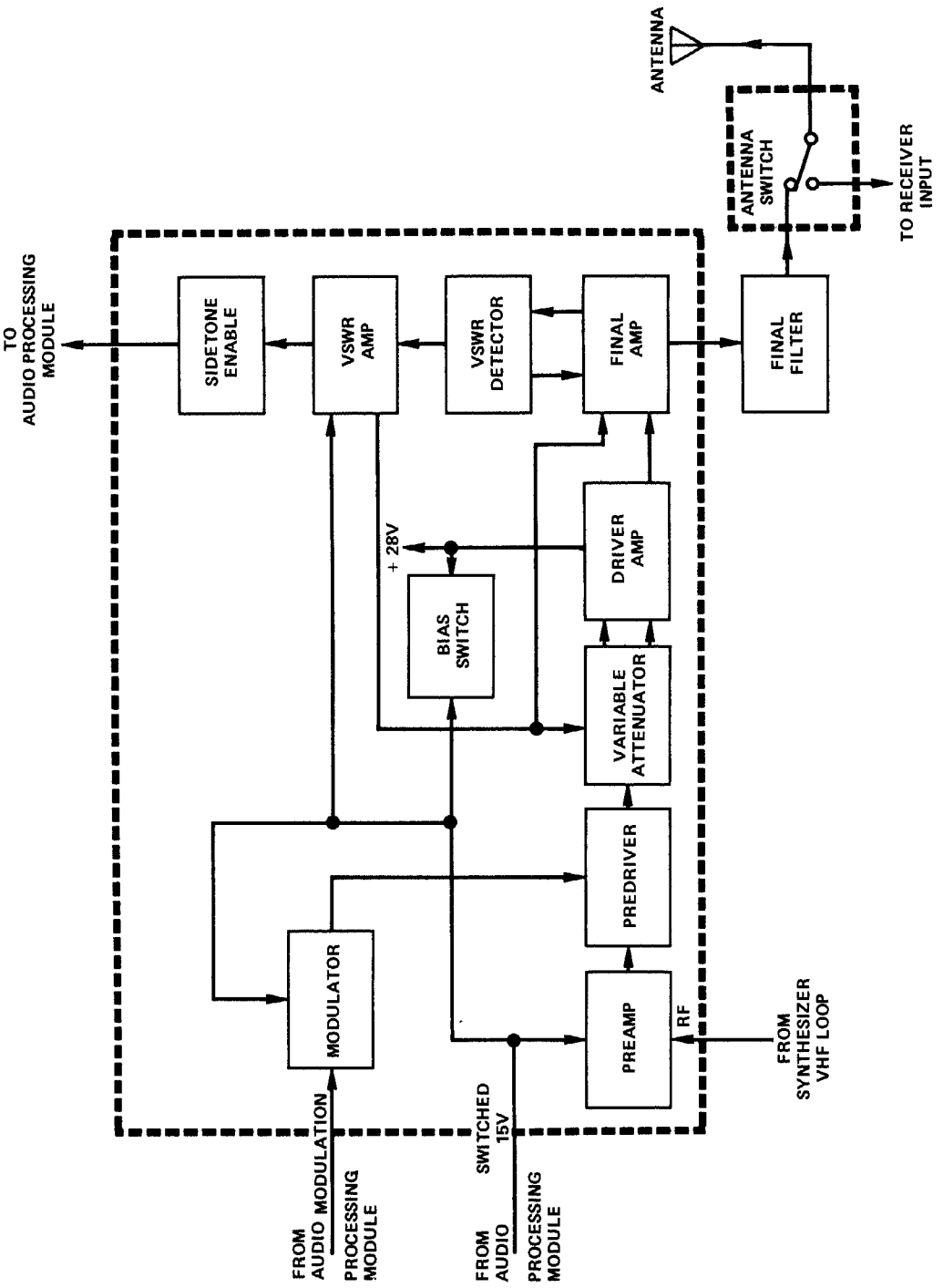
Transmitter
Figure 014

**ON A/C 001-100,

(Ref. Fig. 015)
(4)Synthesizer
(a)Low frequency loop (Ref. Fig. 016)
The synthesizer tuning word, clock and enable signal from the data interface module are applied through the input buffers to the LSI inputs. The 2.56 MHz crystal oscillator generates the reference frequency, which is applied to a frequency divider in the LSI device to provide the 2.5 KHz. The IF vco output is fed, via the vco buffer and LSI driver to the LSI devise, where it is divided down. Then the divided output is compared to the 2.5 KHz reference frequency and a control voltage for the LF vco is generated. This signal is fed to the phase detector logic, resulting in a steady DC level at the output of the phase detector filter. The DC tuning voltage is applied to the loop filter. The LF vco operates at frequencies of 11.80 MHz to 15.74 MHz depending upon the tuning voltage applied from the loop filter. The LF vco output is routed, via the vco buffer and VHF LOOP DRIVER to the synthesizer VHF loop.
The mode control circuit is activated by an output from the LSI device to select between the two different frequency bands. It provides an output to the LF vco which selects a frequency between 11.80 MHz to 13.60 MHz in the transmit mode, or 13.94 MHz to 15.74 MHz in the receive mode. It also goes to the VHF VCO to select either a transmitter drive frequency of 118.000 MHz to 135.975 MHz or a receiver mixer drive frequency of 139.400 MHz to 157.375 MHz depending upon the mode selected.
The mode control output is also applied to the transmit enable gate. In the transmit mode, this gate provides the transmit enable signal to the synthesizer VHF Loop.
(b)VHF LOOP

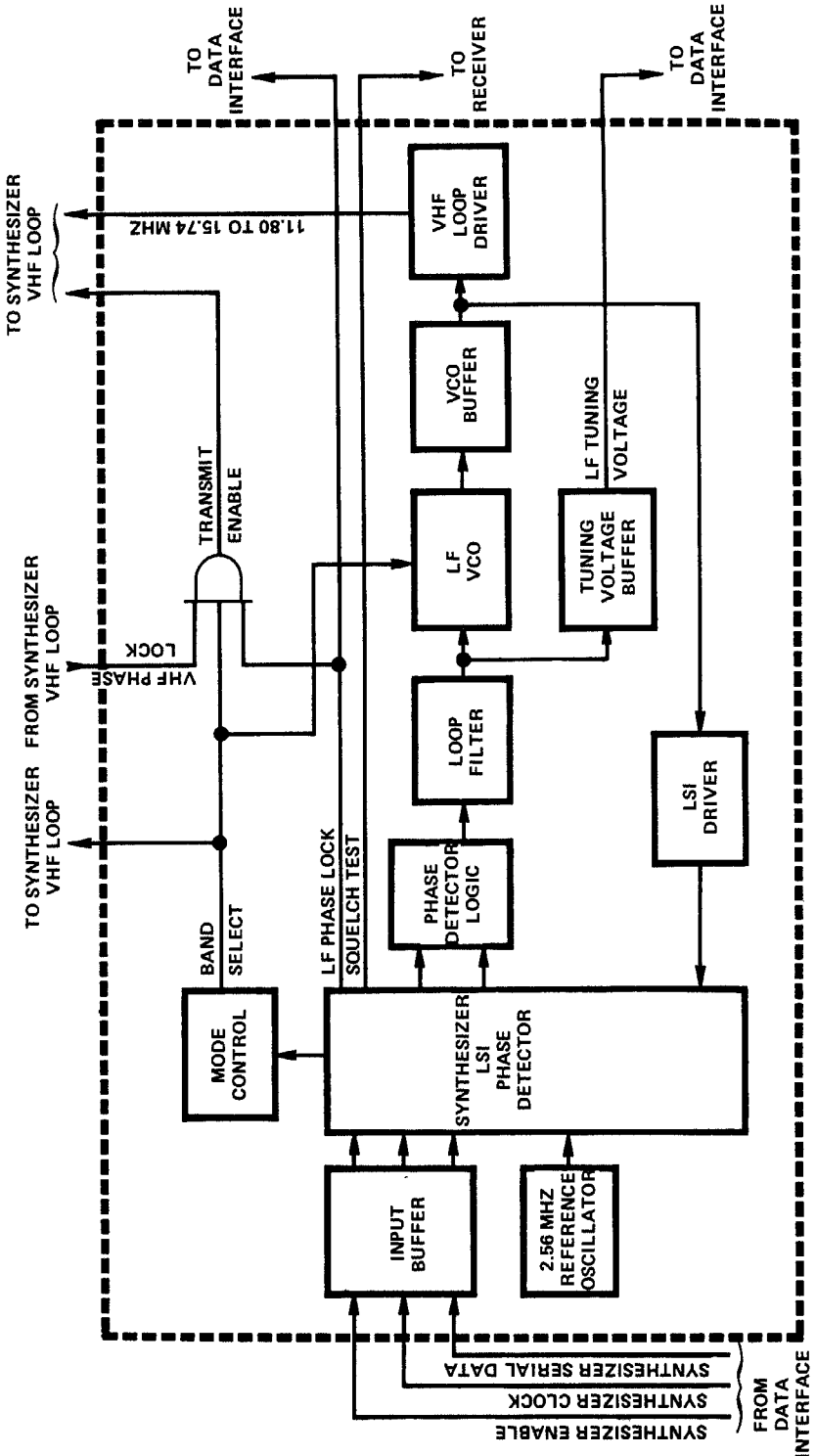
**ON A/C 105-200,

(4)Frequency synthesizer (Ref. Fig. 017)
The frequency synthesizer provides VHF signals in the frequency range between 118 and 158 MHz with 8.33 KHz or 25 KHz spacing.
It is composed of a 1.96-MHz temperature-compensated crystal oscillator (TCXO) and two voltage-controlled oscillators (VCO'S).
The voltage-controlled oscillators are used to provide the VHF voltages in receive and transmit modes.
The frequency accuracy of these oscillators is checked by the 1.96-MHz crystal oscillator.
(5)ARINC 429 Message Decoding Circuit
The ARINC 429 bus receivers transform the ARINC 429 message into TTL logic signals which are fed to the microprocessor. After processing, the microprocessor sends information to the synthesizer.
The microprocessor continuously checks the received message.
In the event of a fault, the microprocessor ignores the new message and



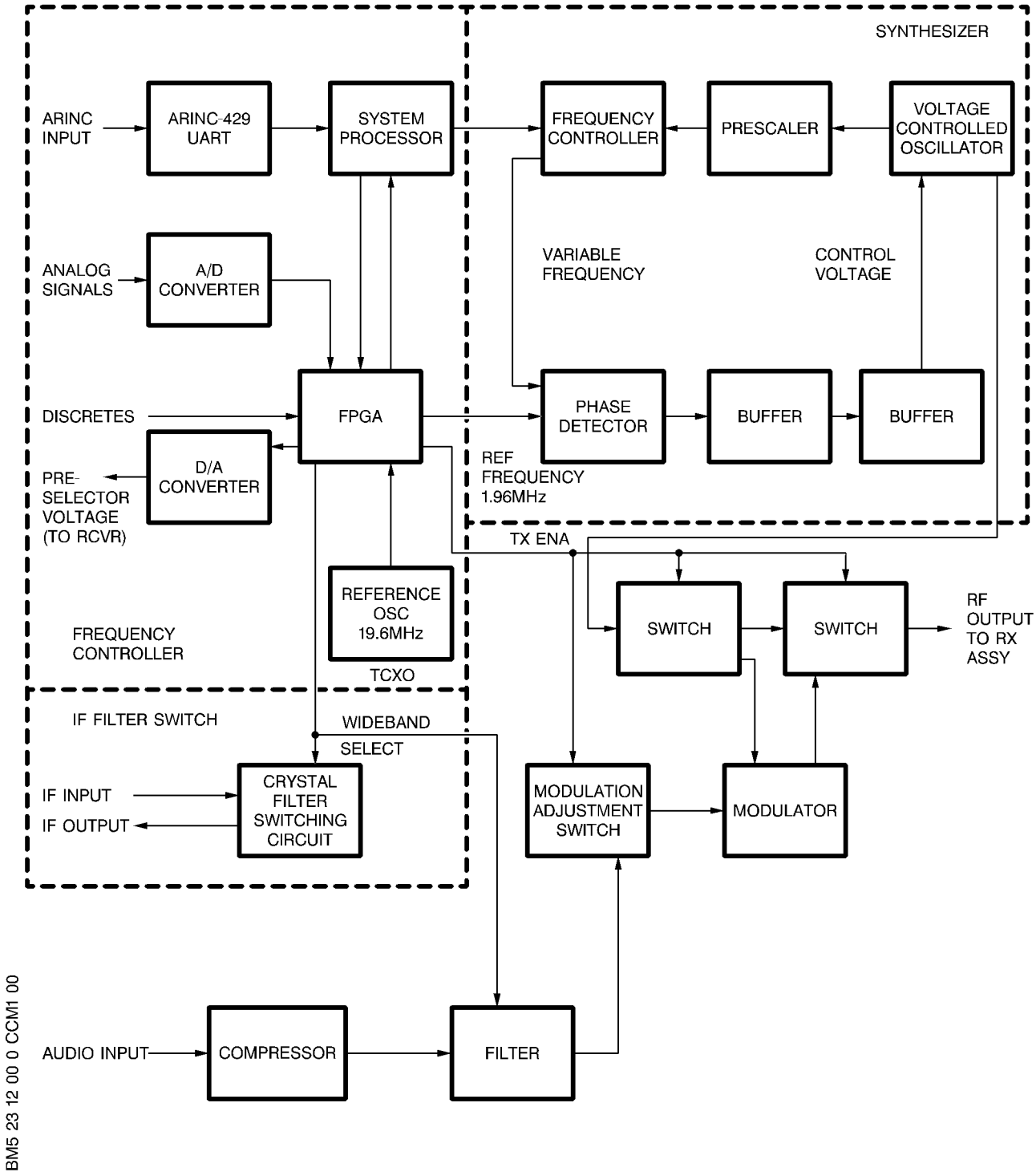

Transmitter
Figure 015

holds the last valid item of information.




BM5 23 12 00 0 CEM0 16

Synthesizer LOW Frequency Loop
Figure 016




Frequency Synthesizer
Figure 017

**ON A/C 001-100, 105-200,

(Ref. Fig. 018)

**ON A/C 001-100,

The frequency from VHF LOOP DRIVER (11.80 to 15.74 MHz) which is one-tenth the operating frequency of the VHF VCO, is applied through the input buffer to the VHF phase detector. This frequency provides the reference at the VHF LOOP and it is compared with the VHF VCO frequency divided by ten. The phase detector output is applied to the LOOP filter to obtain the VHF VCO DC tuning voltage. The VHF VCO output goes through the VCO buffer amplifier and is fed back to the phase detector through the counter driver and divide-by-10 counter. The output from the VCO amplifier is also fed to the RF amplifier, which applies its output to both the LO RF switch on TX RF switch.
The LO RF switch is turned on in the receive mode, allowing the mixer drive to be sent to the receiver. The transmit enable signal, from the synthesizer LF Loop switches on the TX RF switch and at the same time switches off the LO RF switch, enabling the transmitter drive output to be routed to the transmitter and disabling the receive mixer drive in the transmit mode.

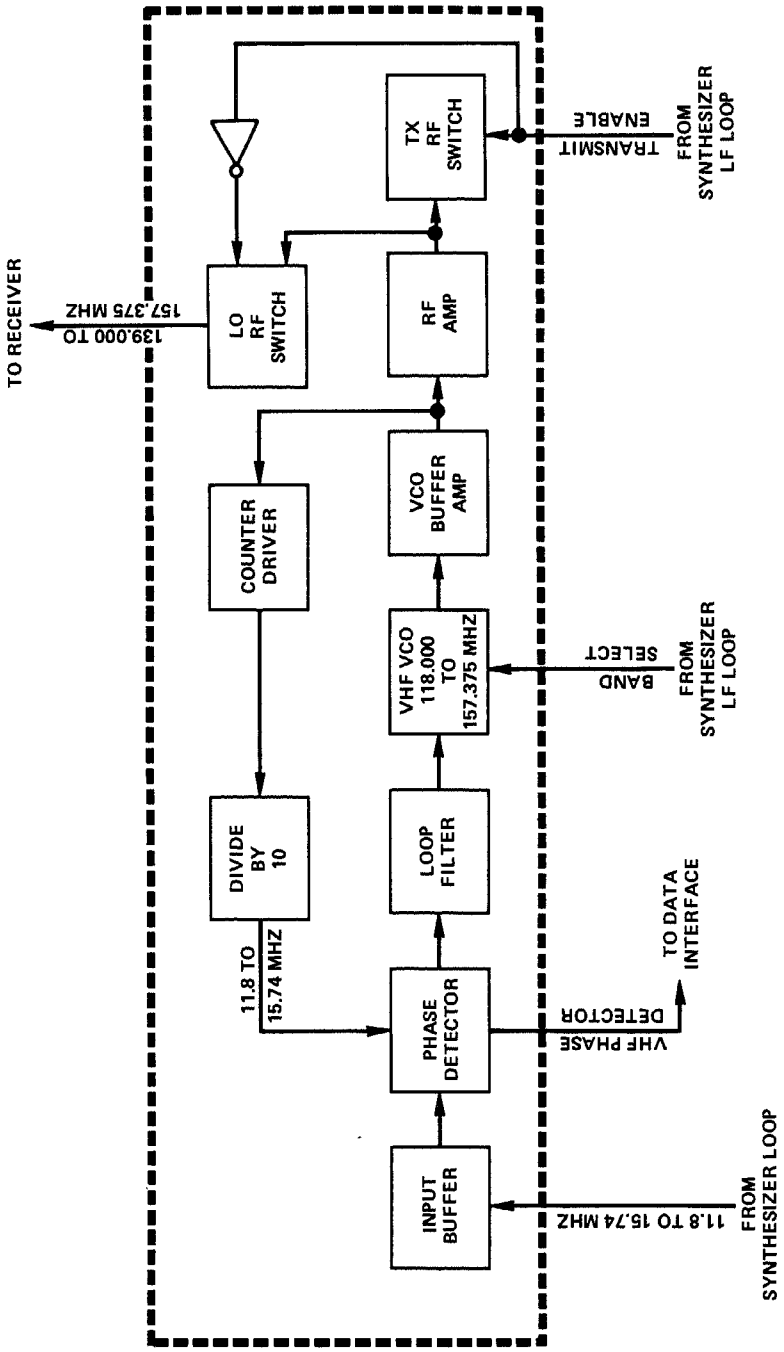
(5)Audio Processing Module

R **ON A/C 105-200,

R The frequency from VHF LOOP DRIVER (11.80 to 15.74 MHz) which is
R one-tenth the operating frequency of the VHF VCO, is applied through
R the input buffer to the VHF phase detector. This frequency provides the
R reference at the VHF LOOP and it is compared with the VHF VCO frequency
R divided by ten. The phase detector output is applied to the LOOP filter
R to obtain the VHF VCO DC tuning voltage. The VHF VCO output goes
R through the VCO buffer amplifier and is fed back to the phase detector
R through the counter driver and divide-by-10 counter. The output from
R the VCO amplifier is also fed to the RF amplifier, which applies its
R output to both the LO RF switch on TX RF switch.
R The LO RF switch is turned on in the receive mode, allowing the mixer
R drive to be sent to the receiver. The transmit enable signal, from the
R synthesizer LF Loop switches on the TX RF switch and at the same time
R switches off the LO RF switch, enabling the transmitter drive output to
R be routed to the transmitter and disabling the receive mixer drive in
R the transmit mode.
R (6)Audio Processing Module

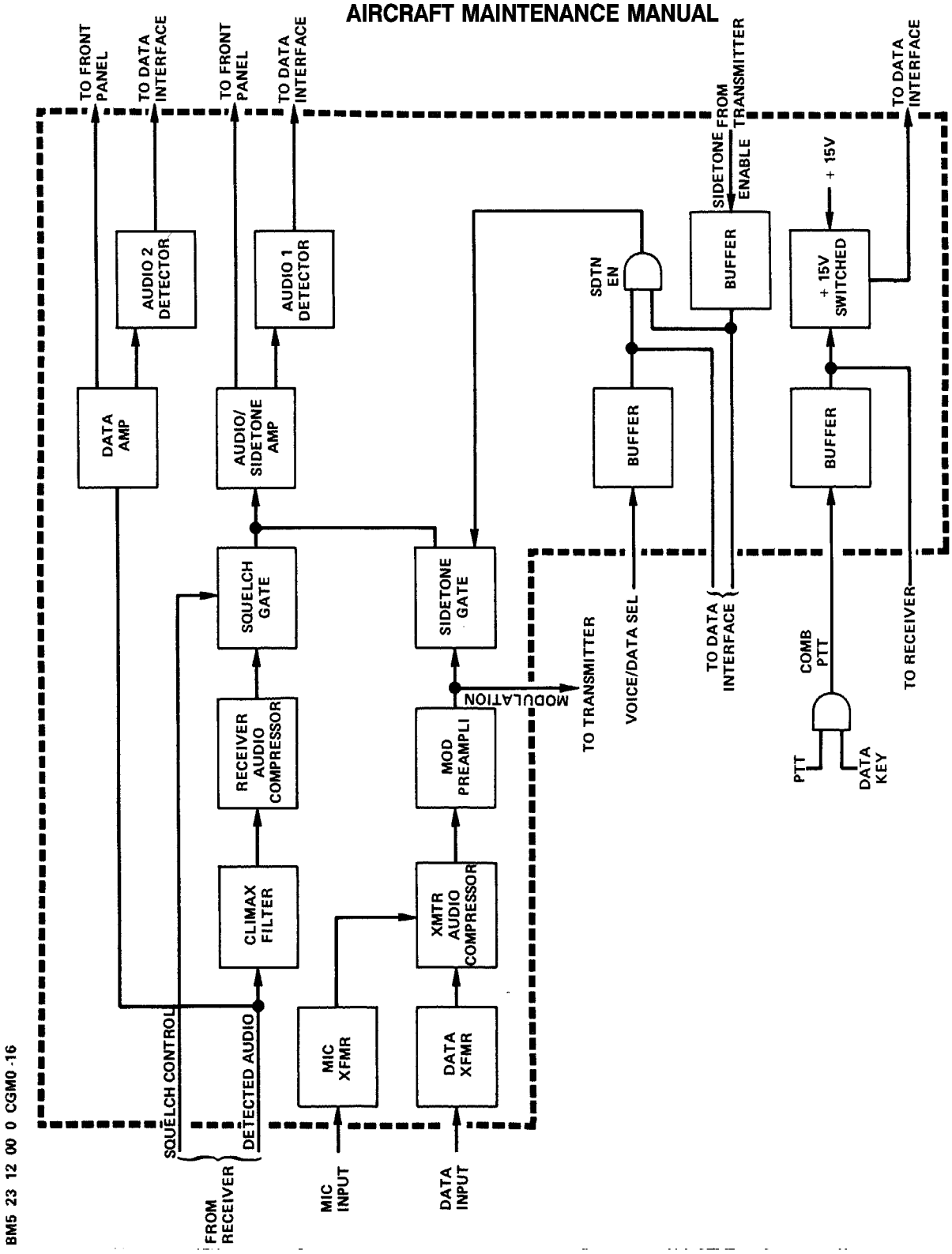
**ON A/C 001-100, 105-200,

(Ref. Fig. 019)
The transmitter audio compressor holds the peak audio signals at a constant level to maintain a relatively constant average modulation percentage of the transmitter carrier. The output will not exceed 5 volts




BM5 23 12 00 0 CFM0 16

Synthesizer VHF LOOP
Figure 018




Audio Processing Module
Figure 019

peak-to-peak regardless of input voltage levels. This output is fed through the modulator amplifier to the transmitter. It also is routed to the sidetone gate, which passes the sidetone signal to the receiver audio circuit.
Detected audio from receiver is applied to the CLIMAX filter and to the data amplifier. Data is amplified and sent to the front panel data transformer and out to the aircraft on the data output line. The CLIMAX filter provides a sharp cutoff to any frequencies over 2500 Hz and a less sharp cutoff to any frequencies below 300 Hz. The output of the CLIMAX filter is fed to the squelch gate, controlled by the squelch control signal, through receiver audio compressor.
The audio/sidetone amplifier amplifies the detected audio from the receiver (in receive mode) or sidetone from the microphone input (in transmit mode). Its output is fed to the front panel voice transformer.
Switched +15 volts is activated only in the transmit mode. Combined PTT is applied through a buffer to obtain the internal PTT signal. This signal is applied to the +15 volts switching circuit. When it is activated, the signal is sent to the transmitter to apply transmitter power.

**ON A/C 105-200,

D. Test
After installation, correct operation of the VHF transceiver can be checked by using the following controls located on the transceiver face :
- SQL/LAMP TEST pushbutton switch
  When pressing the SQL/LAMP TEST pushbutton switch :
  . the squelch is disabled and allows background noise to be heard
  . the green LRU PASS and red CONTROL INPUT FAIL annunciator lights come on.
- CONTROL INPUT FAIL and LRU PASS annunciator lights
  When pressing the TEST pushbutton switch :
  . the green LRU PASS indicator light comes on for 1s approximately to indicate correct operation
  . the red CONTROL INPUT FAIL warning light is off
    NOTE : The red warning light comes on to indicate control data failure (control unit or bus line).
  . the stationary wave ratio appears in the front display.
- RFL/OFF/FWD selector switch
  When placing the RFL/OFF/FWD selector switch in FWD and RFL positions, the forward and reflected powers appear respectively in the front display.

**ON A/C 001-100,

D. Test
After installation, correct operation of the VHF transceiver can be checked by using the following control located on the transceiver face :
- SQL/TEST pushbutton switch :

. the squelch is disabled and allows background noise to be heard.
. the green **COM PASS** annunciator light, the red **COM FAIL** and **DATA IN** warning lights come on for three seconds then go off for three seconds and test results remain displayed until **SQL/TEST** switch is released.

NOTE : A failed module is identified on internal hexidecimal displays. This can be seen by opening the hinged cover on the side of the case.
If a failed module is present, the fault annunciator readout is decoded as shown below.

| FAILED CODE (hex) | FAILED MODULE |
|---|---|
| 1 | Data Interface |
| 2 | Audio Processing |
| *9 | 429 Rate or Speed out of Tolerance |
| A | Synthesizer LF Loop |
| B | Synthesizer VHF Loop |
| C | Receiver |
| D | Transmitter |
| F | Power Supply (except 27.5 Volts) |
| 0 | No Failure |

* External Problem

In the event the front panel switch is held pressed, the test will start again 2 seconds after the front panel **LED** goes off.

**ON A/C 105-200,

(Ref. Fig. 020)

**ON A/C 001-100,

(Ref. Fig. 021)

**ON A/C 001-100, 105-200,

## 8. VHF Control Unit

### A. Description

**ON A/C 001-100,

(Ref. Fig. 022)

**ON A/C 105-200,

(Ref. Fig. 023)

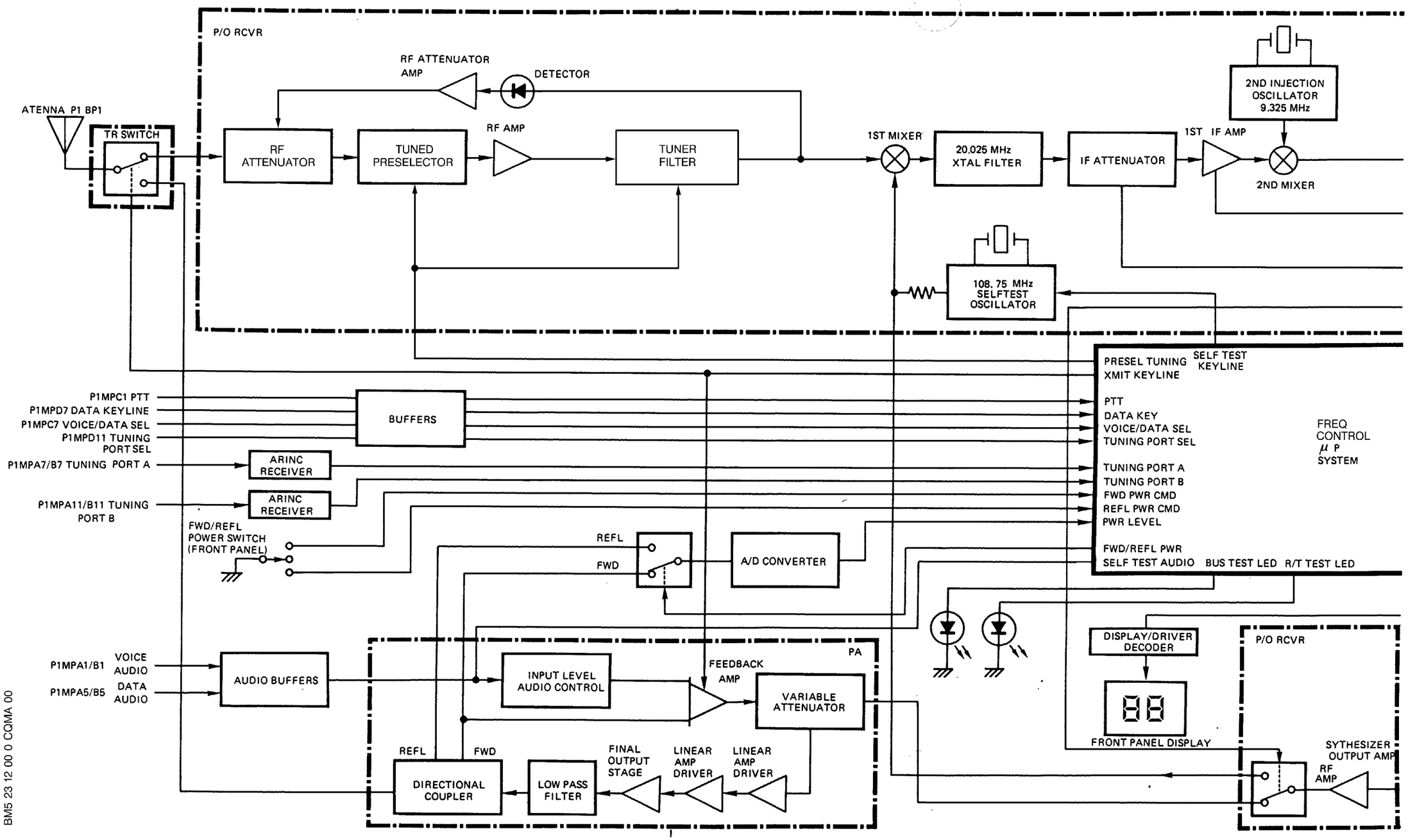
**ON A/C 001-100,

The VHF control unit is a rectangular case in conformity with **ARINC 716**

INTENTIONALLY BLANK

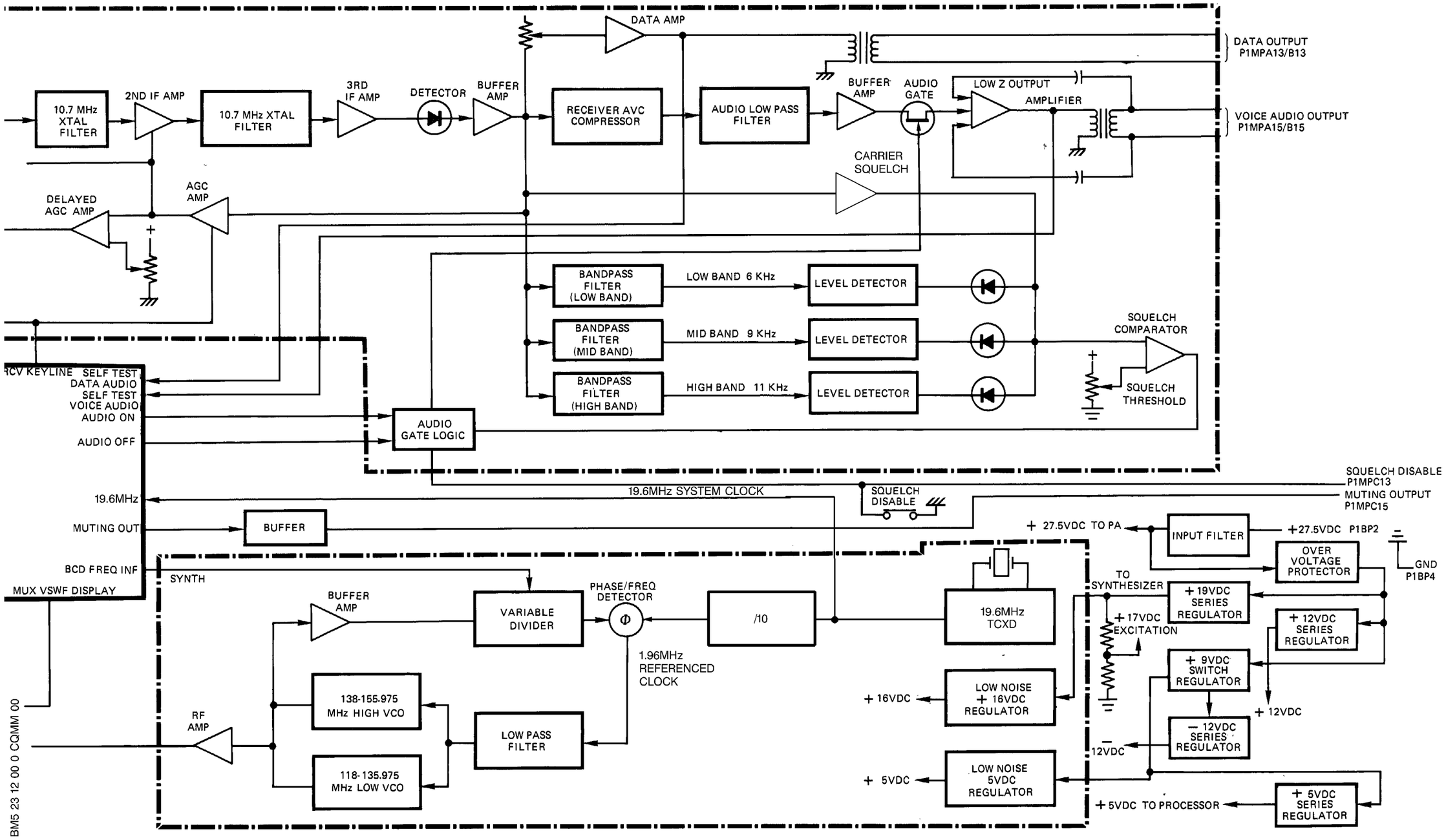


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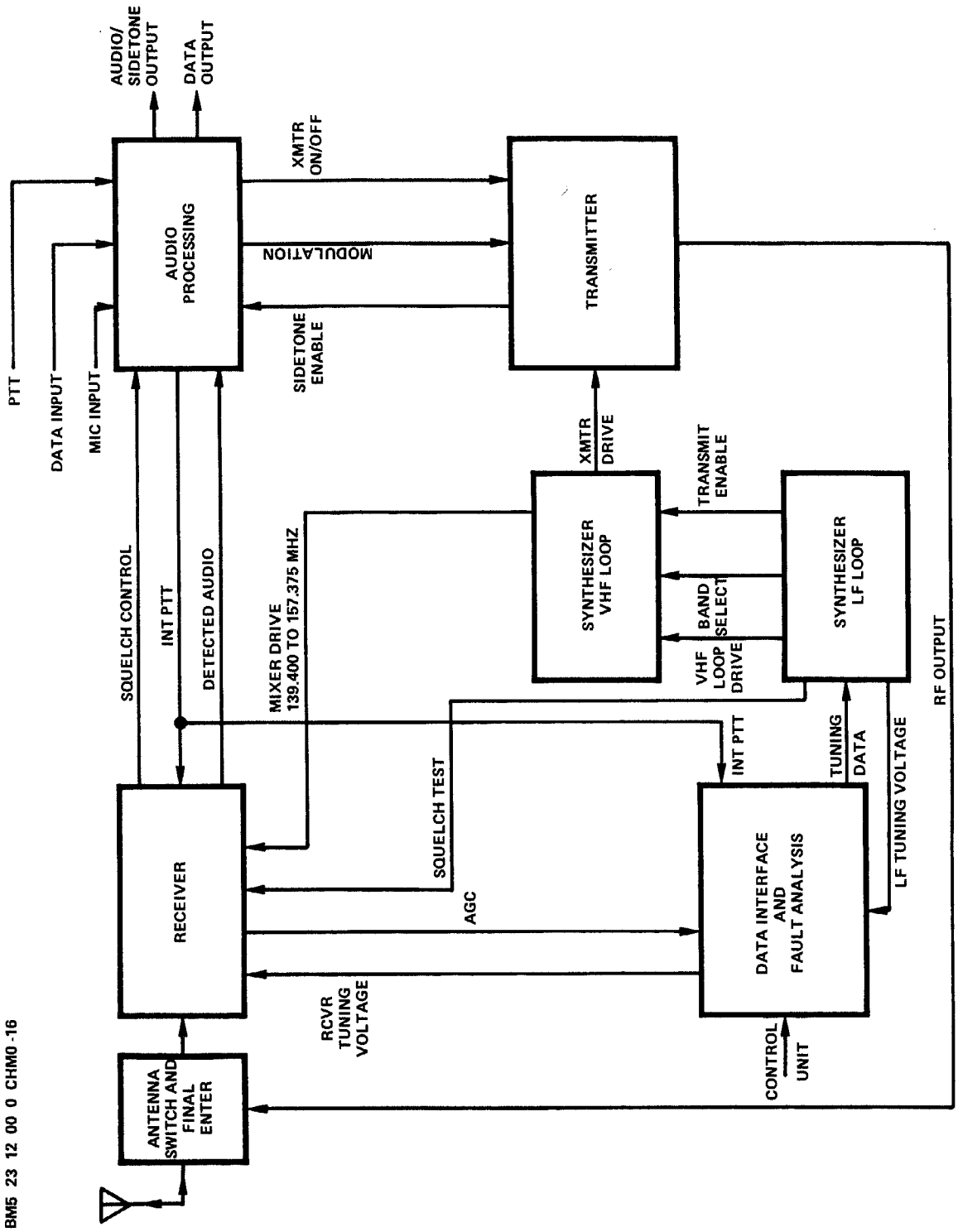



BM5 23 12 00 0 CQMA 00

VHF Transceiver - Block Diagram (Sheet 1/2)
Figure 020

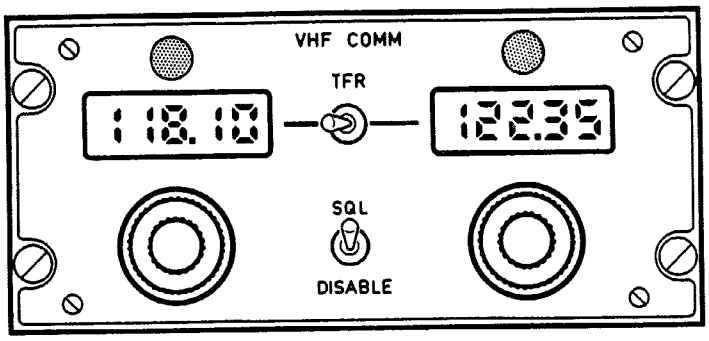



VHF Transceiver - Block Diagram (Sheet 2/2)
Figure 020



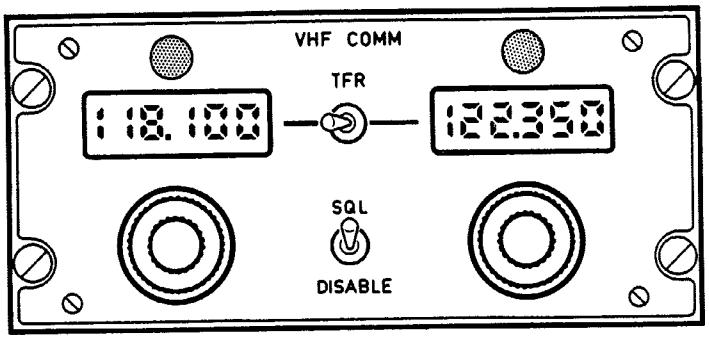

VHF Transceiver - Block Diagram
Figure 021

R




BM5 23 12 00 0 8CP2

VHF Control Unit
Figure 022




BM5 23 12 00 0 CDM1 00

R

VHF Control Unit
Figure 023

specifications.
The face features :
- two frequency displays (liquid crystal displays)
- two green indicator lights
- two sets of two concentric knobs

**ON A/C 105-200,

The VHF control unit is a rectangular case in conformity with ARINC 716 specifications.
The face features :
- two frequency displays (liquid crystal displays)
- one set of two concentric knobs

**ON A/C 001-100,

- a squelch control (SQL/DISABLE) switch.

- a transfer (TFR) switch

**ON A/C 105-200,

- a transfer (TFR) pushbutton switch

**ON A/C 001-004,

B. Characteristics
Frequency range : 118 to 135.975 MHz
Channel spacing : 25 KHz
Signal output characteristics : ARINC 429

**ON A/C 005-100,

B. Characteristics
Frequency range : 118 to 136.975 MHz
Channel spacing : 25 KHz
Signal output characteristics : ARINC 429

**ON A/C 105-200,

B. Characteristics
Frequency range : 118 to 136.975 MHz
Channel spacing : 8.33 KHz
Signal output characteristics : ARINC 429

**ON A/C 001-100,

Power requirements : electronic part : 360 mA under 28VDC
lighting part : 390 mA under 5 V/400 Hz
transfer lights : 20 mA per light.

Weight : 2.38 lbs

C. Utilization

**ON A/C 105-200,

Power requirements : electronic part : 7 W under 28VDC
lighting part : 2.7 W under 5 V/400 Hz
Weight : 2.5 lbs.

C. Utilization

**ON A/C 001-100,

The frequency is selected by rotating the concentric knobs located under the displays independently of the TFR switch position.
The outer knob enables display of high values (tens and units of MHz), the inner knob enables display of small values (tenths and hundredths of MHz).
Thousandths of MHz are not displayed.
Multiple values of 25 KHz (25 - 50 - 75 - 100) are obtained by displaying the following figures in the window corresponding to the hundredths of MHz : 2 - 5 - 7 - 0.
The frequency value transmitted to the considered VHF transceiver corresponds to the value displayed in the window selected by means of the TFR switch (green indicator light on). The frequency transfer is obtained by placing the TFR switch in the other position.

D. Operation

**ON A/C 105-200,

The frequency is selected by rotating the concentric knobs located under the STANDBY Display. The outer knob enables display of high values (tens and units of MHz), the inner knob enables display of small values (tenths, and hundredths of MHz).
Multiple values of 8.33 KHz are displayed in the window corresponding to the hundredths of MHz.
The pushbutton switch located between the two displays will determine which of the two frequencies will be the active frequency.
The TFR pushbutton switch allows the interchanged of the ACTIVE and the STANDBY frequencies.

D. Operation

**ON A/C 001-100,

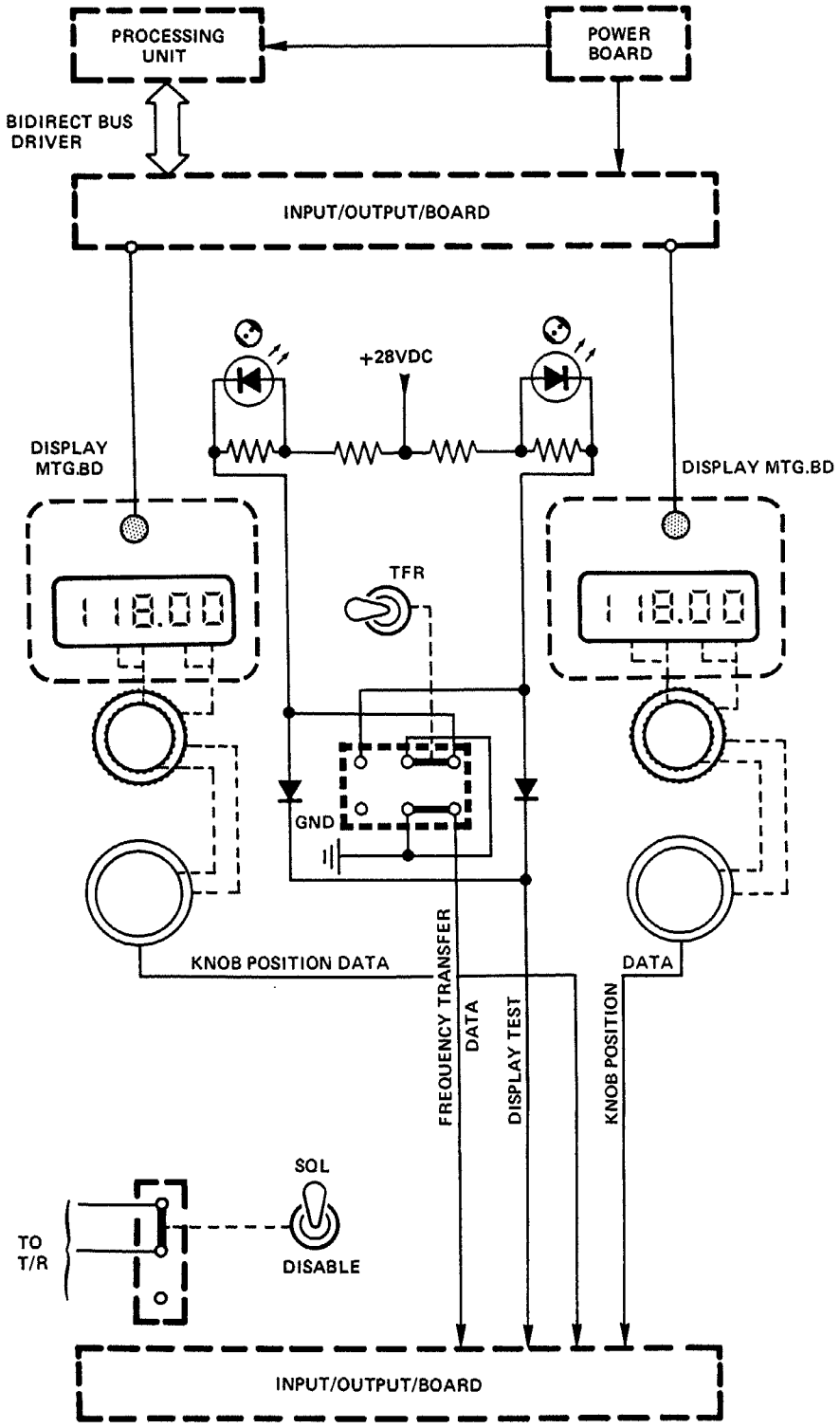
(Ref. Fig. 024)

**ON A/C 105-200,

(Ref. Fig. 025)

**ON A/C 001-100,

The frequency value data corresponding to the knob position data are sent to the input/output board through a coding device.
This board ensures, through a data bus, transmission of voltage levels (0 - 5 V) read on coders, to the processing unit board. The processing unit board equipped with microprocessor processes the message transmitted by the input board and converts it into a 32-bit logic message consistent with




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DM5

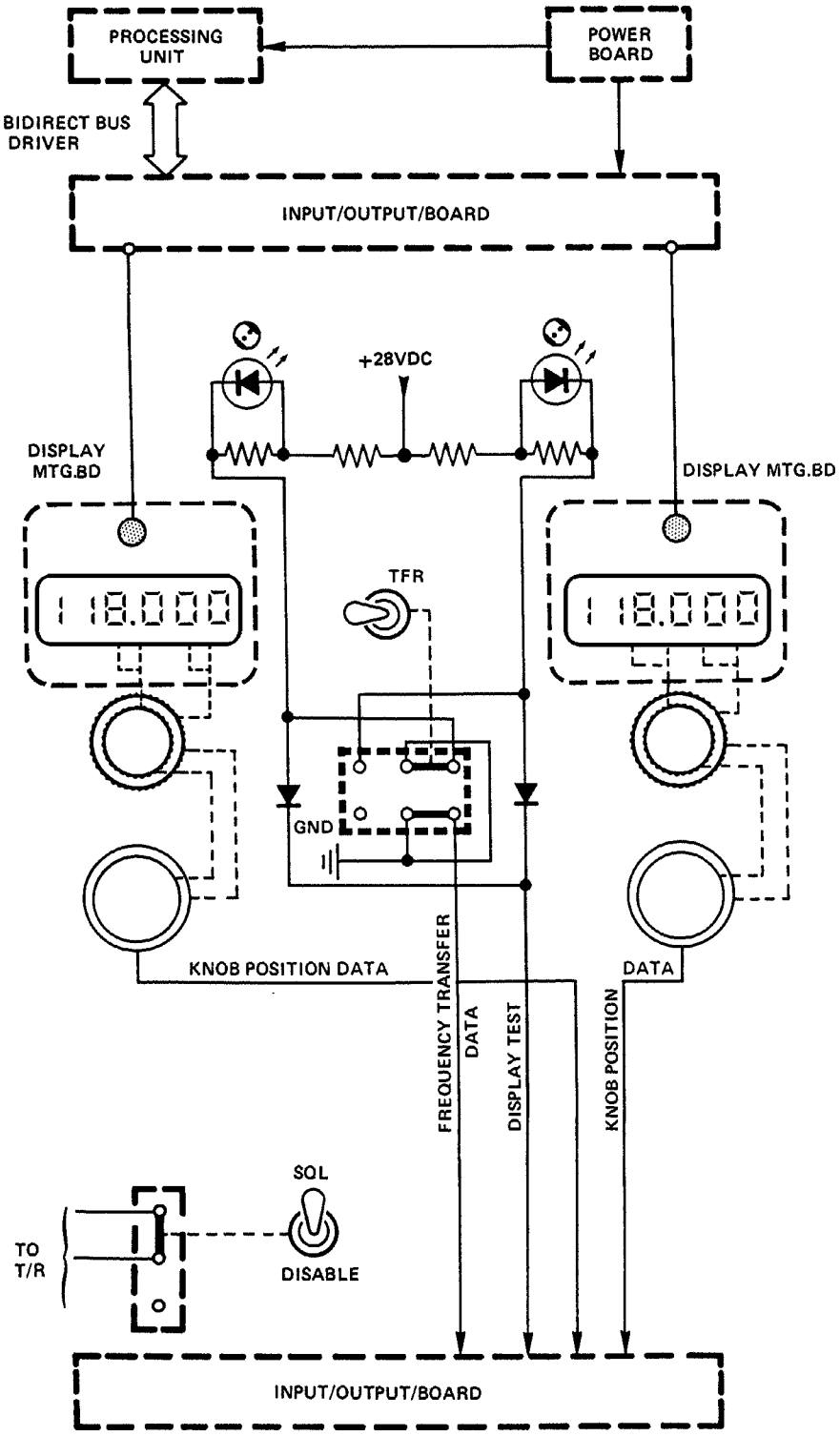
VHF Control Unit - Block Diagram
Figure 024

R EFFECTIVITY: 001-100,

PIA



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VHF Control Unit - Block Diagram
Figure 025

ARINC 429 Specification.
Data exchange between the microprocessor and the input/output board is ensured by a bidirectional bus driver.
The input/output board transmits logic data from the microprocessor to the driver decoders which generate liquid crystal display control signals and voltages.

**ON A/C 001-100, 105-200,

E. Display Test
Display and indicator light test is performed by placing the ANN LT switch 6LP (Ref. 33.14) on overhead panel in TEST position. In this case :
- digits display 8
- transfer indicator lights come on.

## 9. VHF Antenna

### A. Description

(Ref. Fig. 026)

The VHF antenna is a blade antenna.

The front part has a metal leading edge which protects it against erosion and electric discharges.

The rear part is made of fiberglass.

It also includes a heating system (not used on any aircraft).

The antenna is connected to other components by means of a coaxial cable.

A C-type coaxial connector isolated by a moisture barrier is located at the lower part of the antenna.

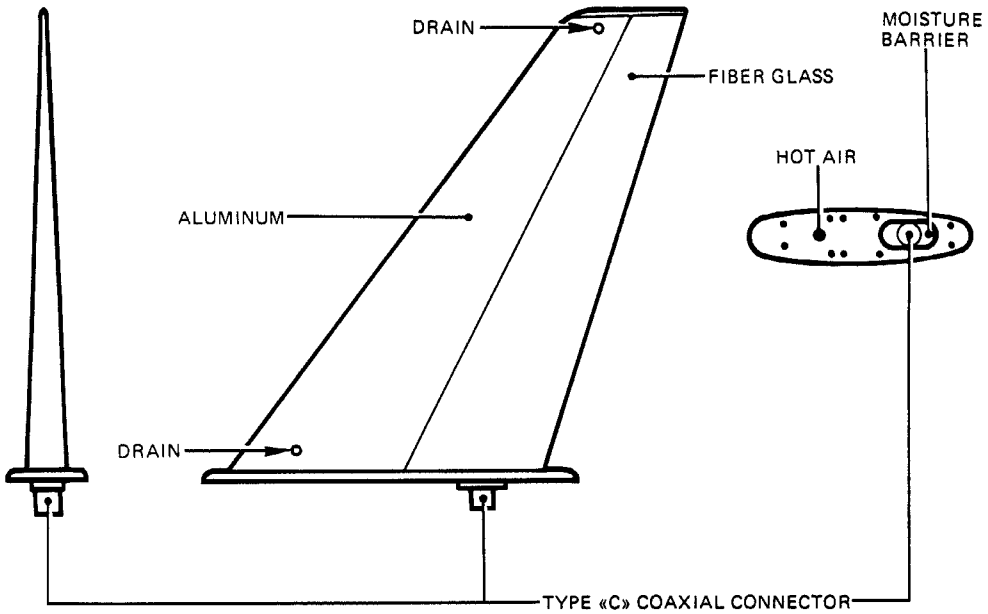
The VHF antenna is screwed on to the fuselage.

### B. Operation

The VHF antenna, the height of which corresponds to a quarter of the wavelength, provides quasi-omnidirectional radiation.

It is designed to allow transmission and reception of VHF signals over the 116 to 156 MHz frequency range.

Its impedance is 50 ohms and its standing-wave ratio 2.




BM5 23 12 00 0 BGM2·00

VHF Antenna
Figure 026

1. Operational Test

A. Reason for the Job
To check reception and transmission from any crew member's station.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.

(1)Job set-up

NOTE 1 : The aircraft should preferably be placed outside hangar.
NOTE 2 : The following adjustment/test procedure will be performed at any crew member's station.

- Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
- Make certain that electronics racks ventilation is correct.
- Close overhead panel circuit breakers, particularly those associated with RADIO-NAV & COM systems.

NOTE : In the following test, the fonctional designations of the acoustic equipment and interphone switch on the ACP are given for information only. These designations depend on aircraft customization.

- Make certain that RADIO/INTER switches and PTT switches are in intermediate position at all crew member's stations.
- Connect a boomset to each crew member jack panel.

(2)Test

NOTE : The following adjustment/test procedure is for VHF1 system. Procedure for VHF2 and VHF3 systems is identical, the electrical identifiers being shown in parentheses.

| ACTION | RESULT |
|---|---|
| 1. On VHF1 (VHF2, VHF3) control unit<br>- with left knob select the frequency of another transmitting station in left window<br>- with right knob select another frequency of a transmitting station in the right window<br>- place TFR switch to the left | On VHF1 (VHF2, VHF3) control unit<br>- indicator light located above the left window comes on. |
| 2. On audio control panel of selected station<br>- engage VHF1 (VHF2, VHF3) | At selected station<br>- selected transmission is received |

| ACTION | RESULT |
|---|---|
| transmission key<br>- disengage VHF1 (VHF2, VHF3) reception pushbutton switch, adjust reception level. | - reception level adjustment should operate progressively without causing any crackling. |
| 3. On VHF1 (VHF2, VHF3) control unit<br>- place TFR switch to the right | On VHF1 (VHF2, VHF3) control unit<br>- indicator light located above the right window comes on while the other indicator light goes off<br>At selected station<br>- received station is changed. |
| - place SQL/DISABLE switch in DISABLE position<br>- place it in SQL position | Background noise is amplified at Headset<br>Make certain that squelch circuit operates. |
| CAUTION : BEFORE TRANSMITTING, MAKE CERTAIN THAT THE SELECTED FREQUENCY IS FREE AND OBSERVE RADIO REGULATIONS. | |
| 4. On VHF1 (VHF2, VHF3) control unit<br>- select an authorized frequency (in right window). | |
| 5. On audio control panel of selected station<br>- while holding RADIO/INTER switch or PTT switch in RADIO position, speak into boomset | - check quality of reception at boomset. |
| 6. Release RADIO/INTER switch or PTT switch. | |

(3)Close-up
(a)On audio control panels
- engage VHF1 (VHF2, VHF3) reception key.
- disengage INT transmission key.

(b)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(c)Restore system and aircraft to normal operating condition.

1. Operational Test

A. Reason for the Job
To check reception and transmission from any crew member's station.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.

(1)Job set-up

NOTE : - The aircraft should preferably be placed outside hangar.

NOTE : - The following adjustment/test procedure will be performed at any crew member's station.

- Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
- Make certain that electronics racks ventilation is correct.
- Close overhead panel circuit breakers, particularly those associated with RADIO-NAV & COM systems.

NOTE : In the following test, the functional designations of the acoustic equipment and interphone switch on the ACP are given for information only. These designations depend on aircraft customization.

- Make certain that RADIO/INTER switches and PTT switches are in intermediate position at all crew member's stations.
- Connect a boomset to each crew member jack panel.

R **ON A/C 001-100,

(2)Test

NOTE : The following adjustment/test procedure is for VHF1 system. Procedure for VHF2 and VHF3 systems is identical, the electrical identifiers being shown in parentheses.

| ACTION | RESULT |
|---|---|
| 1. On VHF1 (VHF2, VHF3) control unit<br>- with left knob select the frequency of another transmitting station in left window<br>- with right knob select another frequency of a transmitting station in the right window<br>- place TFR switch to the left | On VHF1 (VHF2, VHF3) control unit<br>- indicator light located above the left window comes on. |

| ACTION | RESULT |
|---|---|
| 2. On audio control panel of selected station<br>- engage VHF1 (VHF2, VHF3) transmission<br>- disengage VHF1 (VHF2, VHF3) reception pushbutton switch, adjust reception level | At selected station<br>- selected transmission is received<br>- reception level adjustment should operate progressively without causing any crackling. |
| 3. On VHF1 (VHF2, VHF3) control unit<br>- place TFR switch to the right | On VHF1 (VHF2, VHF3) control unit<br>- indicator light located above the right window comes on while the other indicator light goes off<br>At selected station<br>- received station is changed. |

R **ON A/C 105-200,

R (2)Test
R NOTE : The following adjustment/test procedure is for the VHF1 system.
R Procedure for VHF2 and VHF3 systems is identical, the electrical
R identifiers being shown in parentheses.

| R ACTION | RESULT |
|---|---|
| R 1. On VHF1 (VHF2, VHF3) control unit<br>R - turn the selector knobs to select the test frenquency<br>R - push the TFR pushbutton switch | On VHF1 (VHF2, VHF3) control unit<br>- the STANDBY display shows the preselected frequency<br>- the frequency in the STANDBY display moves to the active display<br>- the frequency in the active display is transmitted to the radio equipment |
| R 2. On audio control panel of selected station<br>R - engage VHF1 (VHF2, VHF3) transmission key<br>R - disengage VHF1 (VHF2, VHF3) reception pushbutton switch, adjust reception level | At selected station<br>- selected transmission is received<br>- reception level adjustment should operate progressively without causing any crackling. |
| R 3. On VHF1 (VHF2, VHF3) control unit<br>R - push the TFR pushbutton switch | - the frequency in the STANDBY display move to the active display |

R **ON A/C 001-100, 105-200,

| | |
|---|---|
| - push COMM TEST pushbutton | Check that squelch is disabled |

| ACTION | RESULT |
|---|---|
| switch | (background noise is amplified at boomset). |

**ON A/C 105-200,

4. VHF3 VOICE/DATA
- Make certain that the ACARS is energized by closing the following circuit breakers : 10RB, 12RB, 34RB.
- Open the ACARS circuit breaker 23RB or 4RC3 (if fitted).

On VHF3 control unit

| | |
|---|---|
| - push VOICE/DATA pushbutton switch to lock VHF3 in VOICE mode. | - DATA indicator light comes on ACARS fonction is inhibited.<br>- DATA in VHF control unit window is replaced by a frequency (VOICE mode) which becomes active. |
| - make certain that DATA function is not active again after approximately 10 min. | |
| - closed the ACARS circuit breaker 23RB or 4RC3 (if fitted) | |
| - to make a test of emission | - check quality of reception at boomset. |
| - open the ACARS circuit breaker 23RB or 4RC3 (if fitted) | |
| - push VOICE/DATA pushbutton switch to unlock VHF3 from VOICE mode | - DATA indicator light goes off. ACARS function is reset. Frequency (VOICE mode) in control unit window is replaced by DATA. |

**ON A/C 001-100,

CAUTION : BEFORE TRANSMITTING, MAKE CERTAIN THAT THE SELECTED FREQUENCY IS FREE AND OBSERVE RADIO REGULATIONS.

4. On VHF1 (VHF2, VHF3) control unit
- select an authorized frequency (in right window).

**ON A/C 105-200,

CAUTION : BEFORE TRANSMITTING, MAKE CERTAIN THAT THE SELECTED FREQUENCY IS FREE AND OBSERVE RADIO REGULATIONS.

6. On VHF1 (VHF2, VHF3) control unit
- select an authorized frequency (in right window).

| ACTION | RESULT |
|---|---|
| **ON A/C 001-100, | |
| 5. At selected crew member's station<br>- while holding **RADIO/INTER** switch or **PTT** switch in **RADIO** position, speak into boomset | - check quality of reception at **BOOMSET.** |
| 6. Release **RADIO/INTER** switch. | |
| **ON A/C 105-200, | |
| 7. On audio control panel of selected station<br>- while holding **RADIO/INTER** switch or **PTT** switch in **RADIO** position, speak into **BOOMSET.** | - check quality of reception at **BOOMSET** |
| 8. Release **RADIO/INTER** | |
| **ON A/C 001-100, 105-200, | |

(3)Close-up
(a)On audio control panels
- engage **VHF1 (VHF2, VHF3)** reception key.
- disengage **INT** transmission key.

(b)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(c)Restore system and aircraft to normal operating conditions.

## VHF ANTENNA REMOVAL/INSTALLATION

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT MAKE CERTAIN THAT ELECTRICAL CIRCUITS, UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.

R WARNING : CLEANING AGENT (MAT. NO. 11-026) IS DANGEROUS. AVOID INHALING FUMES. USE IN WELL VENTILATED AREA ONLY. MANUFACTURER'S INSTRUCTIONS MUST BE FOLLOWED.

### 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platforms, 8 m (26 ft.) and 2 m (6 ft. 6 in.) |
| B. Material No. 05-013 | Special Materials (Ref. 20-31-00) |
| C. Material No. 09-016 | Sealants (Ref. 20-31-00) |
| D. Material No. 09-019 | Sealants (Ref. 20-31-00) |
| R E. Material No. 11-026 | Cleaning Agents (Ref. 20-31-00) |
| F. Material No. 16-003 | Structure Paints (Ref. 20-31-00) |
| G. | Blanking Cap and Plug |
| H. | Torque Wrench, 0.40 to 0.50 m.daN (35 to 45 lbf.in.) |
| J. | O-Ring |
| Referenced Procedure<br>- 23-12-00, P. Block 501 | VHF System |

### 2. Procedure

A. Job Set-Up

**ON A/C 101-200,

(Ref. Fig. 401)

**ON A/C 001-100,

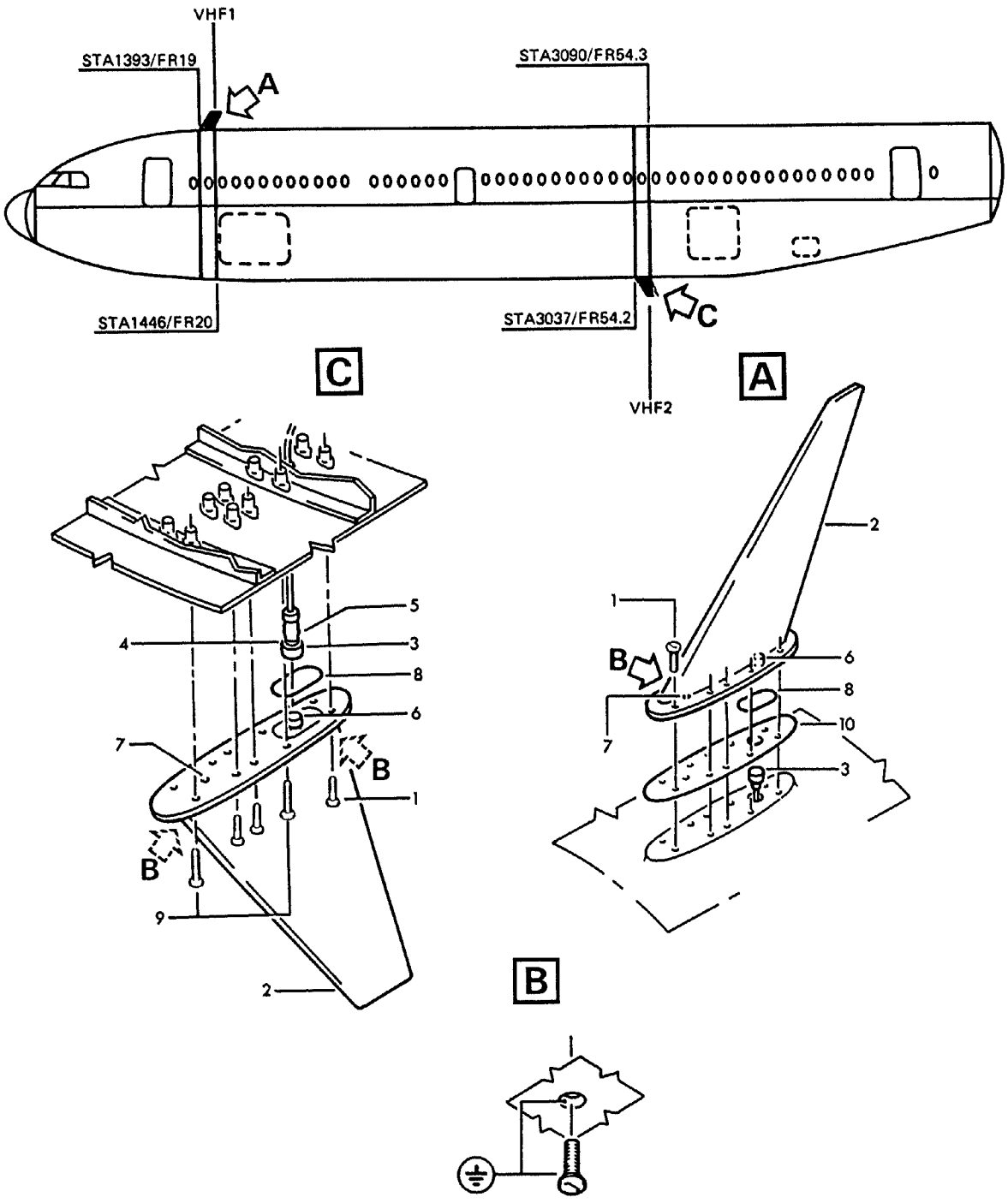
(Ref. Fig. 402)

**ON A/C 101-200,

(1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | VHF 1 | 4RC1 | 208/B16 |
| 21VU | VHF 2 | 4RC2 | 106/D 7 |

(2)Position access Platform.




BM6 23 12 11 4 AAAO 00

VHF Antennas Removal / Installation
Figure 401

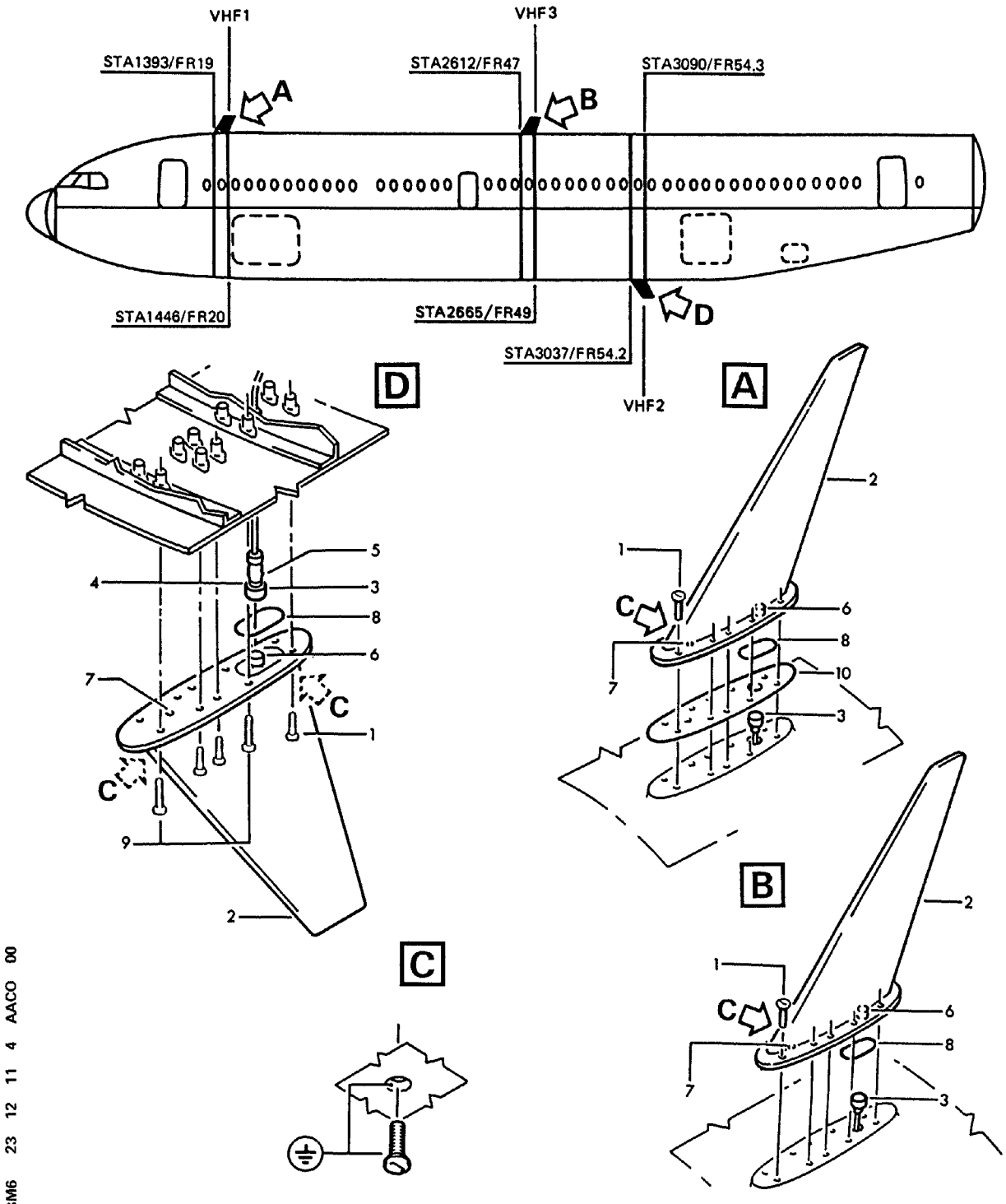
R

R EFFECTIVITY: 101-200,

PIA



Printed in France




VHF Antennas Removal / Installation
Figure 402

R **ON A/C 001-100,

(1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | VHF 1 | 4RC1 | 208/B16 |
| 21VU | VHF 2 | 4RC2 | 106/D 7 |
| 21VU | VHF 3 | 4RC3 | 106/D 8 |

(2)Position access platform.

**ON A/C ALL

B. Removal
(1)For VHF 1 antenna only (with or without adapter plate (10)):
(a)Remove screws (1) from VHF antenna (2).
(b)Lift VHF antenna (2) from fuselage until coaxial cable connector (3) is visible.
R (c)Secure coaxial cable connector (3) to prevent it from falling into the fuselage.
(d)Disconnect coaxial cable connector (3) from VHF antenna connector (6).
(e)Remove and discard the O-ring (8).
(f)Remove the adapter plate (10) if fitted.
(g)Fit blanking cap and plug to VHF antenna connector (6) and coaxial cable connector (3).
(2)Preparation of replacement VHF 1 antenna:
(a)Install blanking plug, supplied with antenna, in base hot air input (7).
(b)Ensure correct installation of the new antenna O-ring (8).
(c)Antenna mounting screws and holes in antenna provide electrical bonding between antenna and fuselage, ensure screws and holes are clean.

R WARNING : CLEANING AGENT (MAT. NO. 11-026) IS DANGEROUS.

(d)Clean contact surfaces of antenna and fuselage using cleaning agent
R (Mat. No. 11-026) and allow to dry.
(e)Apply an even coat of release agent (Mat. No. 05-013) to the
R contact surfaces of antenna and fuselage.
(3)For VHF 2 antenna only:
(a)Remove screws (1) and screws (9) from VHF antenna (2).
(b)Lower VHF antenna (2) from fuselage until coaxial cable connector (3) is visible.
(c)Disconnect coaxial cable connector (3) from VHF antenna connector (6).
(d)Remove and discard O-ring (8).
(e)Fit blanking cap and plug to VHF antenna connector (6) and coaxial cable connector (3).
(f)Release clamp (4) and loosen cover (5) from coaxial cable connector (3).

R WARNING : CLEANING AGENT (MAT. NO. 11-026) IS DANGEROUS.

(g)Remove old sealant from fuselage using cleaning agent
R (Mat. No. 11-026).
(4)Preparation of replacement VHF 2 antenna:
(a)Install blanking plug, supplied with antenna, in base hot air input (7).
(c)Ensure correct installation of new antenna O-ring (8).
(d)Antenna mounting screws and holes in antenna provide electrical bonding between antenna and fuselage, ensure screws and holes are clean.

R WARNING : CLEANING AGENT (MAT. NO. 11-026) IS DANGEROUS.

(e)Clean contact surfaces of antenna and fuselage using cleaning agent
R (Mat. No. 11-026) and allow to dry.
(f)Apply an even coat of release agent (Mat. No. 05-013) to the
R contact surfaces of antenna and fuselage.
(5)For VHF 3 antenna only:
(a)Remove screws (1) from VHF antenna (2).
(b)Lift VHF antenna (2) from fuselage until coaxial cable connector (3) is visible.
R (c)Secure coaxial cable connector (3) to prevent it from falling into the fuselage.
(d)Disconnect coaxial cable connector (3) from VHF antenna connector (6).
(e)Remove and discard the O-Ring (8).
(f)Fit blanking cap and plug to VHF antenna connector (6) and coaxial cable connector (3).

R WARNING : CLEANING AGENT (MAT. NO. 11-026) IS DANGEROUS.

(g)Remove old sealant from fuselage using cleaning agent
R (Mat. No. 11-026).
(6)Preparation of replacement VHF 3 antenna:
R
R
R (a)Install blanking plug, supplied with antenna, in base hot air input (7).
R (b)Ensure correct installation of new antenna O-ring (8).
R (c)Antenna mounting screws and holes in antenna provide electrical bonding between antenna and fuselage, ensure screws and holes are clean.

R WARNING : CLEANING AGENT (MAT. NO. 11-026) IS DANGEROUS.

R (d)Clean contact surfaces of antenna and fuselage using cleaning agent
R (Mat. No. 11-026) and allow to dry.
R (e)Apply an even coat of release agent (Mat. No. 05-013) to the
R contact surfaces of antenna and fuselage.

C. Installation
NOTE : The VHF 1 antenna can be installed with or without adapter plate (10). Make certain that the correct length screws are used to install the VHF 1 antenna, if adapter plate (10) is not required.
(1)For VHF 1 antenna only (without adapter plate (10)):
(a)Temporarily cover fuselage attachment holes.
(b)Apply sealant (Mat. No. 09-019) to mounting surface of VHF antenna (2) and fuselage.
(c)Remove temporary covering from fuselage attachment holes.
(2)For VHF 1 antenna only (with or without adapter plate (10)):
(a)Remove blanking plug from hot air input (7).
(b)Remove blanking cap and plug from coaxial cable connector (3) and VHF antenna connector (6).
(c)Release coaxial cable (3), if previously secured, and connect to VHF antenna connector (6).
NOTE : Ensure that the new O-ring (8) is installed.

(d)If the adapter plate (10) is required ensure adapter plate (10) is in position and install antenna (2) on fuselage with screws (1).
(e)Tighten screws, alternating from side to side, and torque to between 0.40 and 0.50 m. daN (35 and 45 lbf. in.).
(f)Measure the bonding contact resistance between the antenna and the fuselage structure (Ref. 20-28-11, P. Block 1).
NOTE : Make sure that the bonding contact resistance is not more than 5 milliohm.
(g)Make a sealing bead with sealant (Mat. No. 09-016) around the antenna (2).
(h)Apply sealant (Mat. No. 09-016) to the head of the screws (1).
(j)Make the contour of the sealant on the screws (1) and around the base of antenna (2) smooth.
(k)Let the sealant cure.
(l)Apply structure paint (Mat. No. 16-003) to the sealant around the base of antenna (2) and to the sealant on the head of the screws (1).
R NOTE : It is not mandatory to paint the sealant around the base of the
R antenna and on the head of the screws.

(2)For VHF 2 antenna only:
(a)Temporarily cover fuselage attachment holes.
(b)Apply sealant (Mat. No. 09-019) to mounting surface of VHF antenna (2) and fuselage.
(c)Remove temporary covering from fuselage attachment holes.
(d)Remove blanking plug from hot air input (7).
(e)Remove blanking cap and plug from coaxial cable connector (3) and VHF antenna connector (6).
(f)Release coaxial cable (3), if previously secured, and connect to VHF antenna connector (6).
(g)Replace cover (5) and secure with clamp (4) on coaxial cable connector (3).
NOTE : Ensure that the new O-ring (8) is installed.
(h)Place antenna onto sealant applied to fuselage.
(j)Install antenna (2) on fuselage with screws (1) and where fitted, screws (9).
NOTE : Ensure that the four longer screws (9) securing the bottom-mounted antenna are fitted in the correct position.
(k)Tighten screws, alternating from side to side, and torque to between 0.40 and 0.50 m. daN (35 and 45 lbf. in.).
(l)Remove excess sealant material immediately and smooth edge.
(m)Measure the bonding contact resistance between the antenna and the fuselage structure (Ref. 20-28-11, P. Block 1).
NOTE : Make sure that the bonding contact resistance is not more than 5 milliohm.
(n)Make a sealing bead with sealant (Mat. No. 09-016) around the antenna (2).
(p)Apply sealant (Mat. No. 09-016) to the head of the screws (1).
(q)Make the contour of the sealant on the screws (1) and (9) and around the base of antenna (2) smooth.
(r)Let the sealant cure.
(s)Apply structure paint (Mat. No. 16-003) to the sealant around the base

of antenna (2) and to the sealant on the head of the screws (1) and (9).
NOTE : It is not mandatory to paint the sealant around the base of the antenna and on the head of the screws.

(3)For VHF 3 antenna only:
(a)Temporarily cover fuselage attachment holes.
(b)Apply sealant (Mat. No. 09-019) to mounting surface of VHF antenna (2) and fuselage.
(c)Remove temporary covering from fuselage attachment holes.
(d)Remove blanking plug from hot air input (7).
(e)Remove blanking cap and plug from coaxial cable connector (3) and VHF antenna connector (6).
(f)Release coaxial cable (3), if previously secured, and connect to VHF antenna connector (6).
NOTE : Ensure that the new O-ring (8) is installed.
(g)Place antenna onto sealant applied to fuselage.
(h)Install antenna (2) on fuselage with screws (1).
(j)Tighten screws, alternating from side to side, and torque to between 0.40 and 0.50 m. daN (35 and 45 lbf. in.).
(k)Remove excess sealant material immediately and smooth edge.
(l)Make a sealing bead with sealant (Mat. No. 09-016) around the antenna (2).
(m)Apply sealant (Mat. No. 09-016) to the head of the screws (1).
(n)Make the contour of the sealant on the screws (1) and around the base of antenna (2) smooth.
(p)Let the sealant cure.
(q)Apply structure paint (Mat. No. 16-003) to the sealant around the base of antenna (2) and to the sealant on the head of the screws (1).
NOTE : It is not mandatory to paint the sealant around the base of the antenna and on the head of the screws.

D. Test
R Carry out the VHF Operational Test (Ref. 23-12-00, P. Block 501).

**ON A/C 101-200,

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close circuit breakers 4RC1 and 4RC2.
(3)Remove access platform.

**ON A/C 001-100,

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Remove access platform.

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |
| Referenced Procedure<br>- 23-12-00, P. Block 501 | VHF System |

R **ON A/C 001-100, 105-200,

(Ref. Fig. 401)

R **ON A/C 101-104,

(Ref. Fig. 402)

**ON A/C ALL

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers :

R **ON A/C 001-100, 105-200,

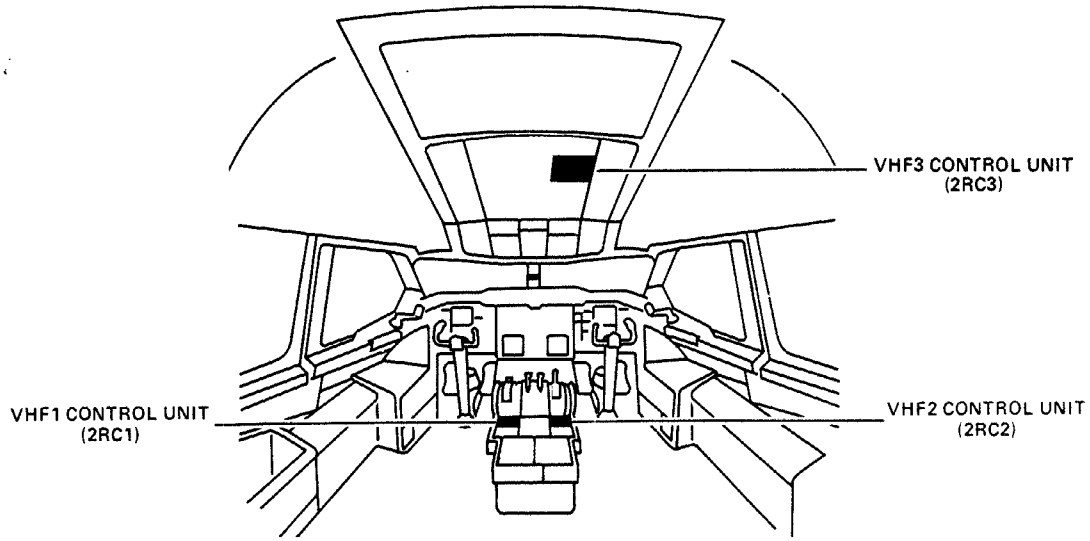
(a)For VHF1 control unit 2RC1

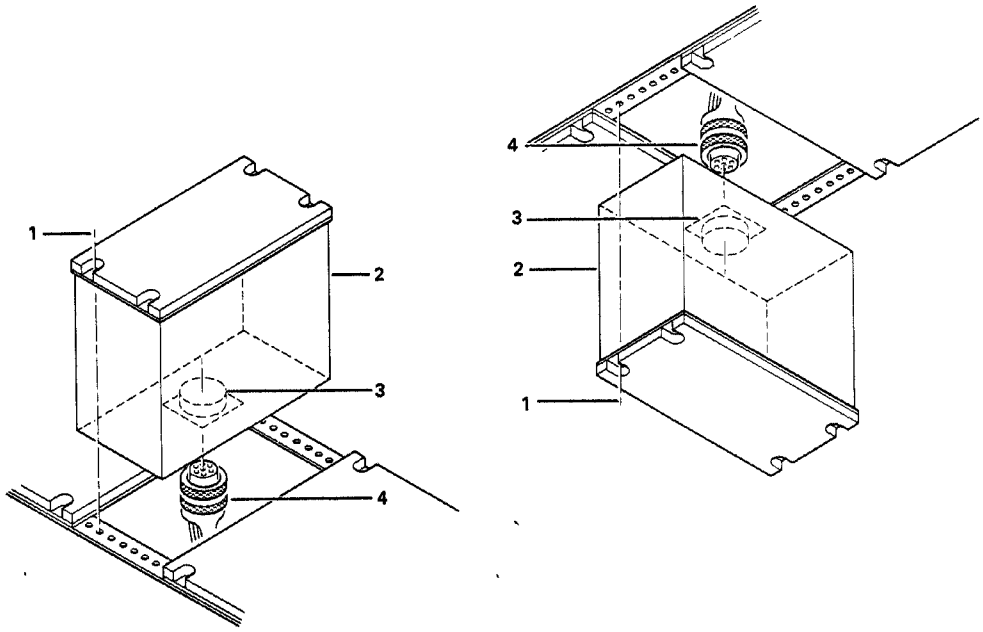
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | COM VHF1 | 4RC1 | 208/B16 |
| 132VU | INTEGRAL LT/C/B & OVHD & PED | 3LF | 322/N77 |
| 132VU | INT LT/ANN LT/DIM | 197LT | 324/L84 |
| 132VU | INT LT/ANN LT/DIM | 198LT | 324/L83 |

(b)For VHF2 control unit 2RC2

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO NAV & COM VHF2 | 4RC2 | 106/D 7 |
| 132VU | INTEGRAL/LT/C/B & OVHD & PED | 3LF | 322/N77 |
| 132VU | INT LT/ANN LT/DIM | 197LT | 324/L84 |
| 132VU | INT LT/ANN LT/DIM | 198LT | 324/L83 |

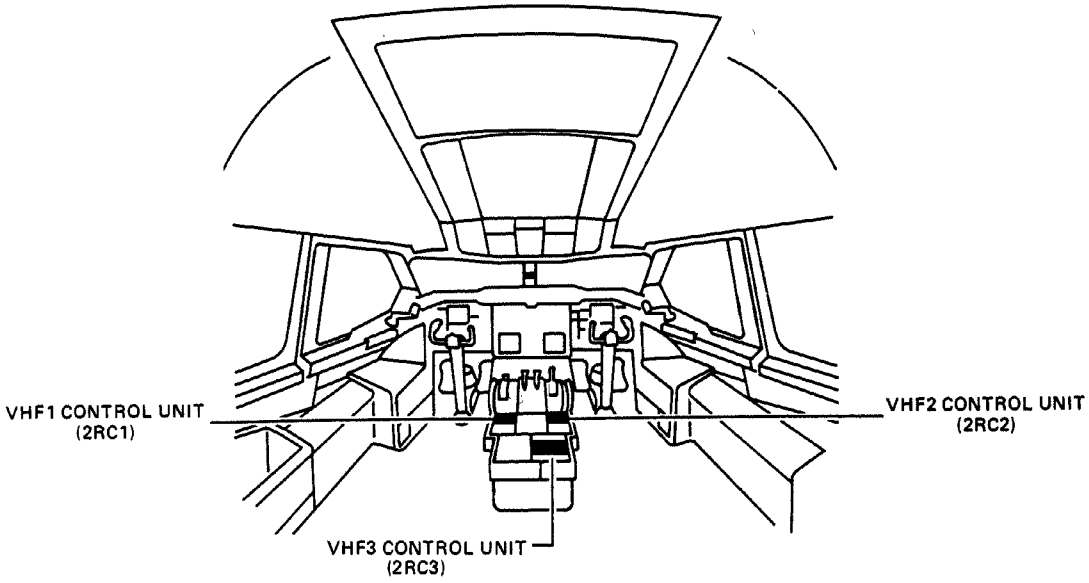
(c)For VHF3 control unit 2RC3

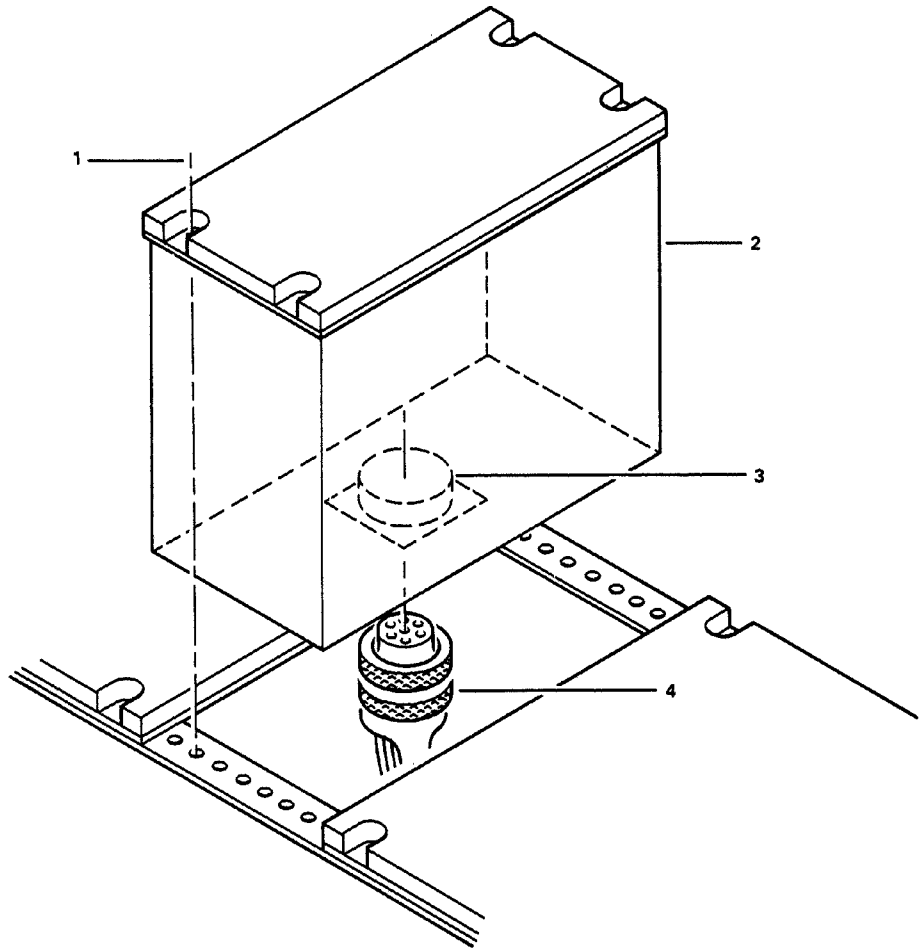



BM5 23 12 13 4 ABM2 24 11
DM5

VHF Control Unit - Removal/Installation
Figure 401




BM5 23 12 13 4 ACM2 2B

VHF Control Unit - Removal/Installation
Figure 402

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO NAV & COM VHF3 | 4RC3 | 106/D 8 |
| 132VU | INTEGRAL LT/C/B & OVHD & PED | 3LF | 322/N77 |
| 132VU | INT LT/ANN LT/DIM | 197LT | 324/L84 |
| 132VU | INT LT/ANN LT/DIM | 198LT | 324/L83 |

R **ON A/C 101-104,

(a)For VHF1 control unit 2RC1

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | COM VHF1 | 4RC1 | 208/B16 |
| 132VU | INTEGRAL LT/C/B & OVHD & PED | 3LF | 322/N77 |
| 132VU | INT LT/ANN LT/DIM | 197LT | 324/L84 |
| 132VU | INT LT/ANN LT/DIM | 198LT | 324/L83 |

(b)For VHF2 control unit 2RC2

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO NAV & COM VHF2 | 4RC2 | 106/D 7 |
| 132VU | INTEGRAL/LT/C/B & OVHD & PED | 3LF | 322/N77 |
| 132VU | INT LT/ANN LT/DIM | 197LT | 324/L84 |
| 132VU | INT LT/ANN LT/DIM | 198LT | 324/L83 |

(c)For VHF3 control unit 2RC3

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO NAV & COM VHF3 | 26RB | 106/D 8 |
| 132VU | INTEGRAL LT/C/B & OVHD & PED | 3LF | 322/N77 |
| 132VU | INT LT/ANN LT/DIM | 197LT | 324/L84 |
| 132VU | INT LT/ANN LT/DIM | 198LT | 324/L83 |

**ON A/C ALL

B. Removal
(1)Unlock Dzus fasteners (1) and pull out VHF control unit (2).
(2)Disconnect electrical connector (4).
(3)Remove VHF control unit (2).
(4)Cap electrical connectors.

R **ON A/C 001-100, 105-200,

C. Installation
(1)Clean and inspect VHF control unit (2) interface.
(2)Remove blanking caps from electrical connectors (3) and (4). Check for correct condition of connectors.
(3)Position VHF control unit and connect electrical connector (4).
(4)Install VHF control unit and attach with Dzus fasteners (1).
(5)Remove safety clips and tags and close circuit breakers 4RC1, 4RC2, 4RC3, 197LT, 198LTand 3LF.

R **ON A/C 101-104,

C. Installation
(1)Clean and inspect VHF control unit (2) interface.
(2)Remove blanking caps from electrical connectors (3) and (4). Check for correct condition of connectors.
(3)Position VHF control unit and connect electrical connector (4).
(4)Install VHF control unit and attach with Dzus fasteners (1).
(5)Remove safety clips and tags and close circuit breakers 4RC1, 4RC2, 26RB, 197LT, 198LT and 3LF.

**ON A/C ALL

D. Test
Carry out an operational test of VHF system (Ref. 23-12-00, P. Block 501).

E. Close-Up
Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

VHF TRANSCEIVER (1RC1, 1RC2, 1RC3) - REMOVAL/INSTALLATION

R **ON A/C 101-104,

VHF TRANSCEIVER (1RC1, 1RC2, 23RB) - REMOVAL/INSTALLATION

**ON A/C ALL

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |
| Referenced Procedure<br>- 23-12-00, P. Block 501 | VHF System |

R **ON A/C 001-100, 105-200,

(Ref. Fig. 401)

R **ON A/C 101-104,

R **ON A/C 001-100, 105-200,

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers :
(a)For VHF1 transceiver 1RC1

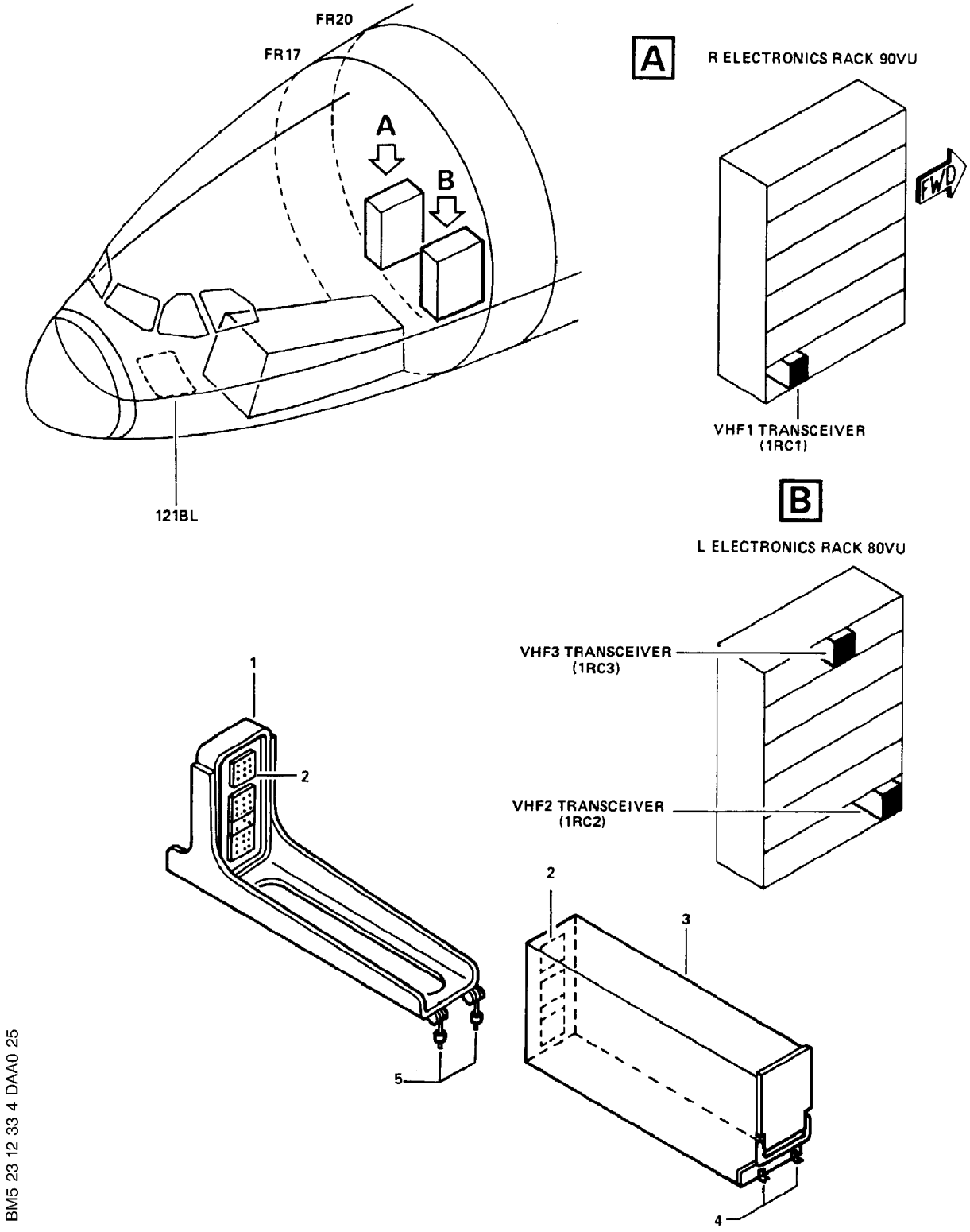
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | COM VHF1 | 4RC1 | 208/B16 |

(b)For VHF2 transceiver 1RC2

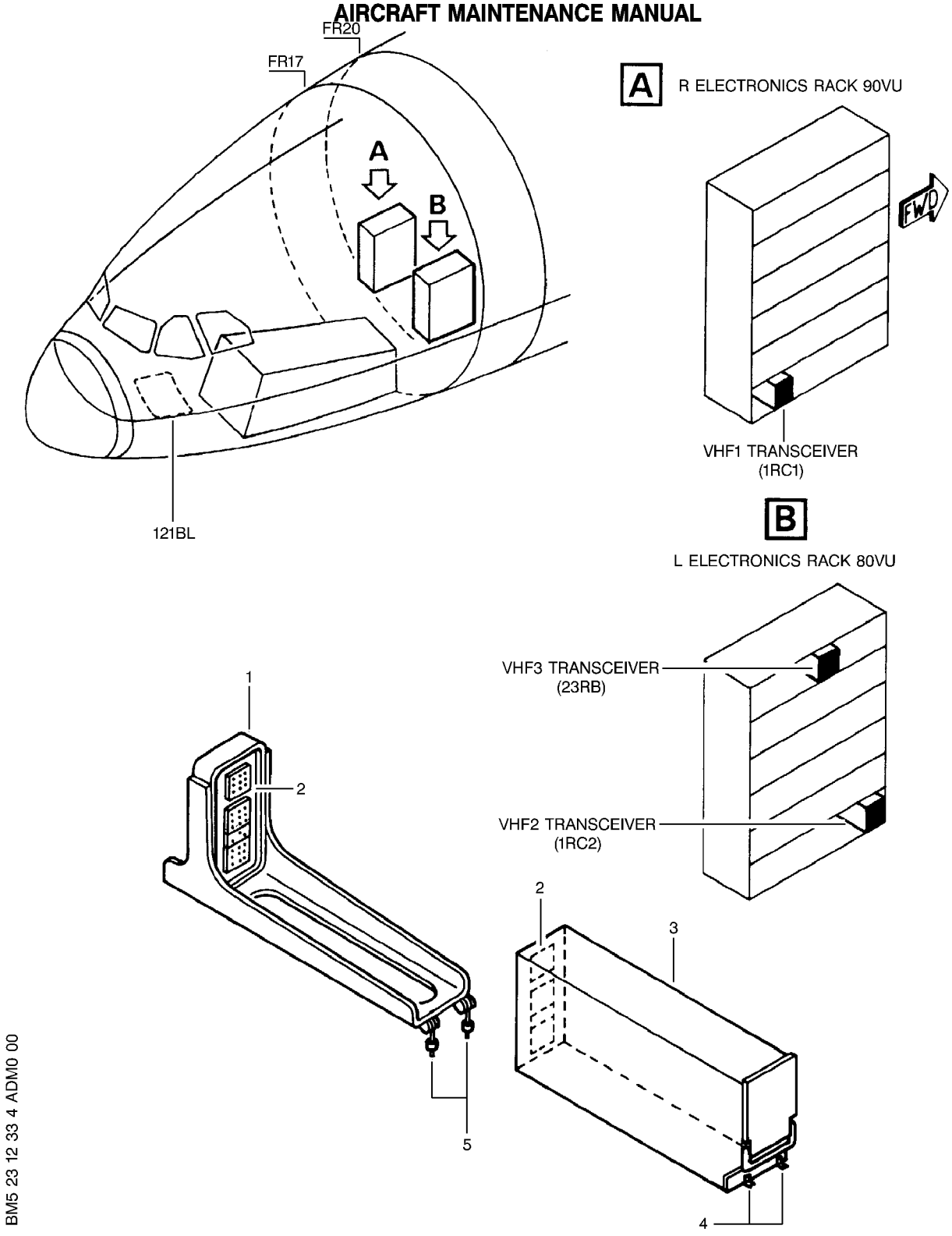
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO NAV & COM/VHF2 | 4RC2 | 106/D 7 |

(c)For VHF3 transceiver 1RC3

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO NAV & COM/VHF3 | 4RC3 | 106/D 8 |




VHF Transceiver - Removal/Installation
Figure 401




VHF Transceiver - Removal/Installation
Figure 402

R **ON A/C 101-104,

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers :
(a)For VHF1 transceiver 1RC1

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | COM VHF1 | 4RC1 | 208/B16 |

(b)For VHF2 transceiver 1RC2

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO NAV & COM/VHF2 | 4RC2 | 106/D 7 |

(c)For VHF3 transceiver 23RB

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO NAV & COM/VHF3 | 26RB | 106/D 8 |

**ON A/C ALL

(2)Open access door 121BL and gain access to avionics compartment.
(3)Gain access to VHF transceiver to be removed. (For VHF1 on shelf 96VU, remove side panel of minimum equipment bay).

B. Removal
(1)Unscrew knurled nuts (5) and free lugs (4) of VHF transceiver
(2)Withdraw VHF transceiver from mount (1).
(3)Remove VHF transceiver (3).
(4)Cap electrical connectors (2).

R **ON A/C 001-100, 105-200,

C. Installation
(1)Clean and inspect VHF transceiver (3) interface.
(2)Remove blanking caps from electrical connectors (2). Check for correct condition of connectors.
(3)Position VHF transceiver on mount and fully push.
(4)Position knurled nuts (5) and tighten onto lugs (4) of VHF transceiver.
(5)Remove safety clips and tags and close circuit breakers 4RC1, 4RC2 and 4RC3.

R **ON A/C 101-104,

C. Installation
(1)Clean and inspect VHF transceiver (3) interface.
(2)Remove blanking caps from electrical connectors (2). Check for correct condition of connectors.
(3)Position VHF transceiver on mount and fully push.
(4)Position knurled nuts (5) and tighten onto lugs (4) of VHF transceiver.
(5)Remove safety clips and tags and close circuit breakers 4RC1, 4RC2 and 26RB.

**ON A/C ALL

D. Test
Carry out an operational test of VHF system (Ref. 23-12-00, P. Block 501).

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Install side panel of minimum equipment bay.
(3)Close access door 121BL.

# SELECTIVE CALLING SYSTEM - DESCRIPTION AND OPERATION

## 1. General

The SELCAL (Selective Calling) system provides visual and aural indicating of calls transmitted by ground stations and received by the aircraft equipment. These calls are transmitted by the ground to the aircraft in the communication radio frequencies.
The communication channels which can be used are : VHF1, VHF2, VHF3, HF1 and HF2.

## 2. Component Location

(Ref. Fig. 001)

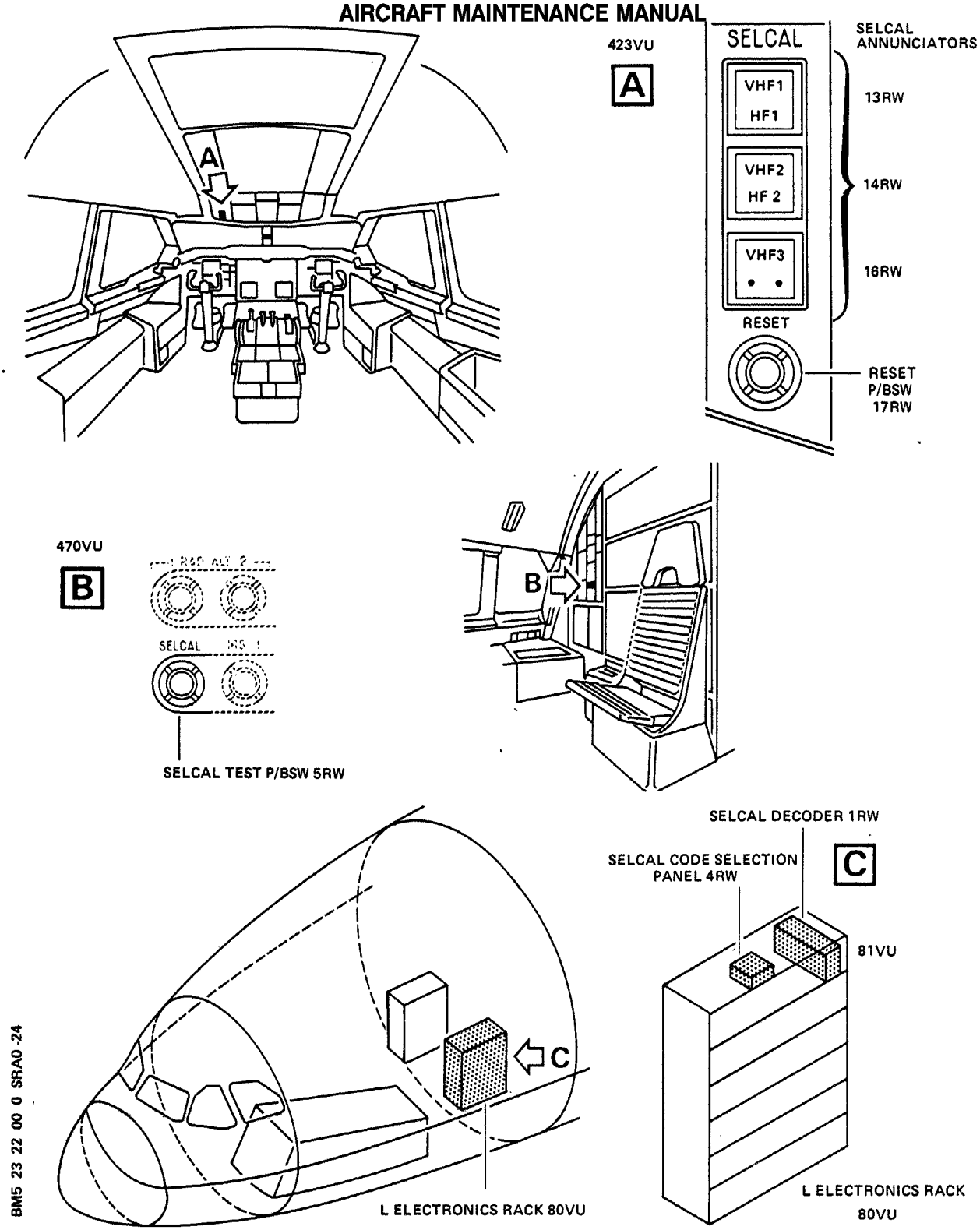
| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 1RW | DECODER - SELCAL | 81VU | 121 | 121BL | 23-22-34 |
| 4RW | CODE SELECTION PNL - SELCAL | | 121 | 121BL | 23-22-12 |
| 5RW | P/BSW - SELCAL TEST | 470VU | 212 | | |
| 13RW | ANNUNCIATOR - SELCAL/VHF1/HF1 | 423VU | 211 | | |
| 14RW | ANNUNCIATOR - SELCAL/VHF2/HF2 | 423VU | 211 | | |
| 16RW | ANNUNCIATOR - SELCAL/VHF3 | 423VU | 211 | | |
| 17RW | P/BSW - RESET | 423VU | 211 | | |

## 3. System Description

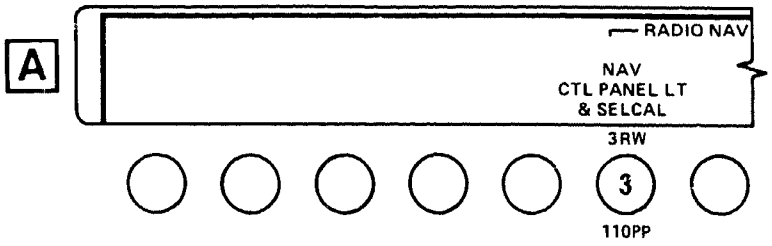
The SELCAL system comprises :
- a SELCAL decoder
- a code selection panel
- two double legend annunciators
- a single legend annunciator
- a SELCAL test pushbutton switch
- a RESET pushbutton switch.

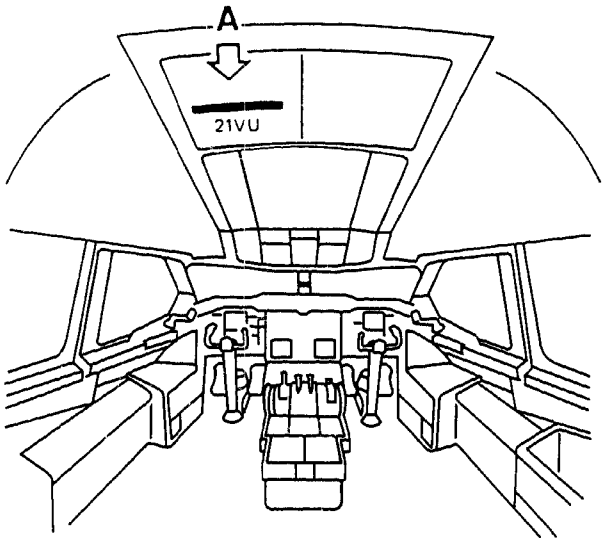
## 4. Electrical Power Supply

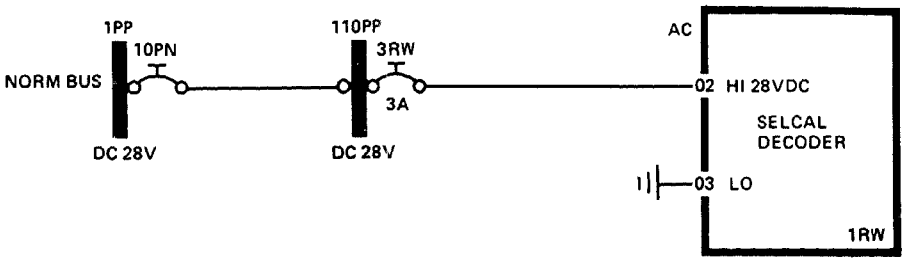
The SELCAL system is supplied with 28VDC from Normal busbar 1PP by busbar 110PP through 3A circuit breaker 3RW located on circuit breaker panel 21VU.
(Ref. Fig. 002)




SELCAL System - Component Location
Figure 001




BM5 23 22 00 0 TGC0 07.12
DM5

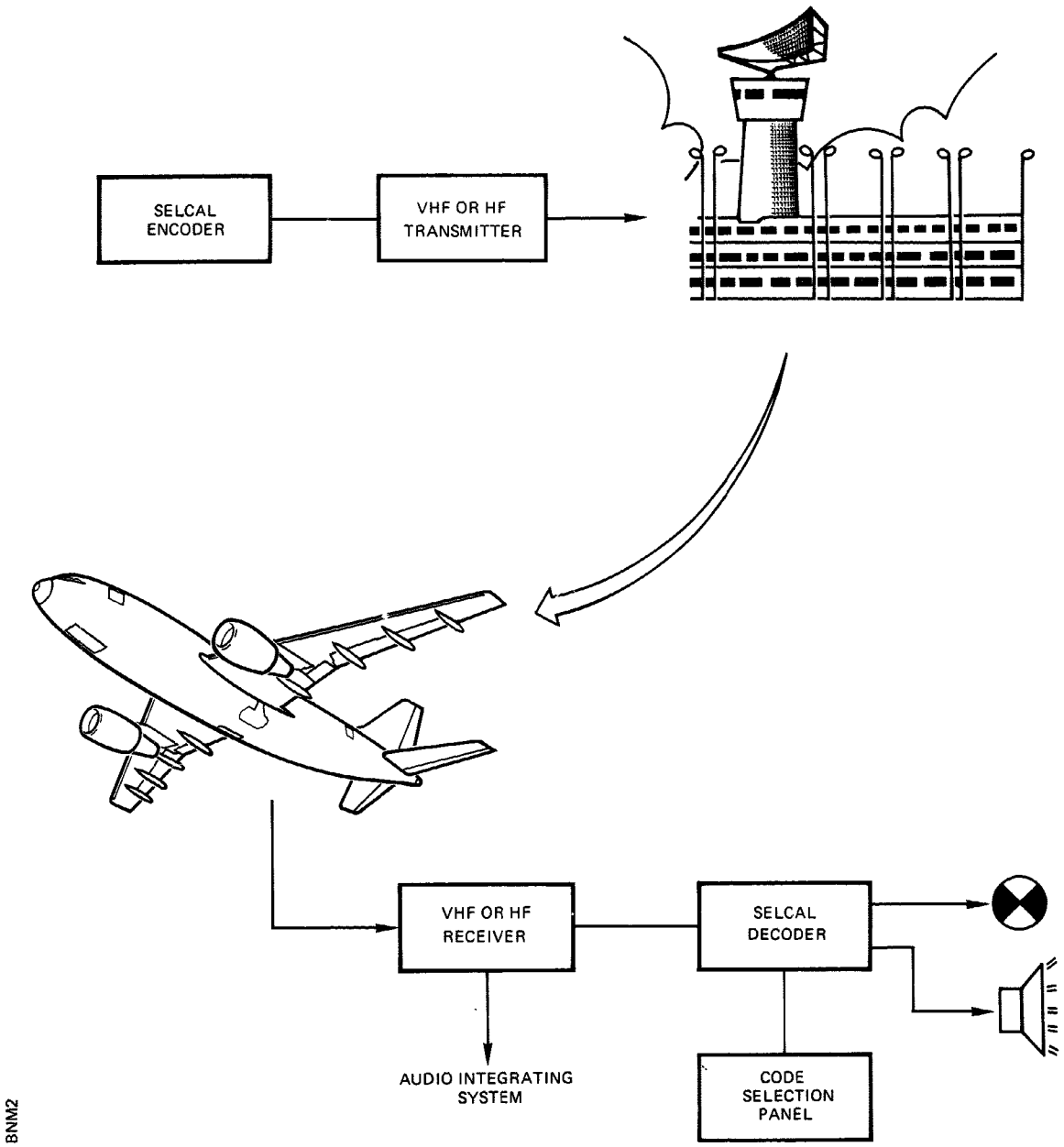
SELCAL System - Electrical Power Supply
Figure 002

5. Operation
(Ref. Fig. 003)

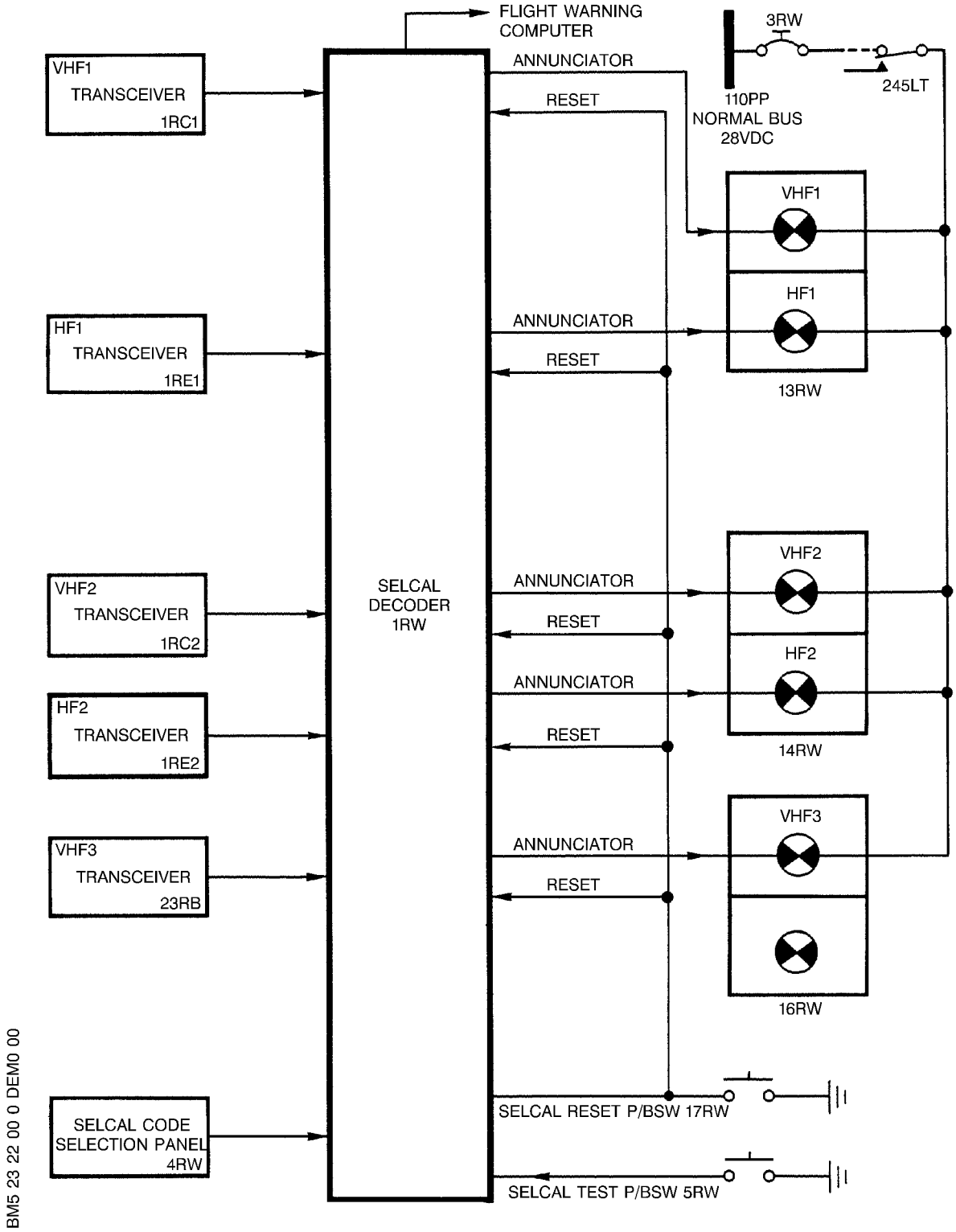
A. Ground System
The ground system transmits, through VHF or HF transmitters, a selective calling code made up of two consecutive pulses with each pulse containing two simultaneously transmitted frequencies for call differentiation.
A call is the code transmitted once only.

B. Aircraft System
(Ref. Fig. 004)
The call signals transmitted by the ground stations (VHF or HF) are received and detected by the aircraft receivers. After detection, these signals are applied to the SELCAL decoder inputs (5).
The SELCAL decoder continuously scrutinizes the five inputs on which calls may be present and determines whether received signals are made up of frequencies corresponding to the aircraft code. This code is selected by means of the code selection panel.
In this case, an audio signal is activated and the call indicator light corresponding to the receiving system (VHF1 - VHF2 - VHF3 - HF1 - HF2) is on.
The audio signal is reset by pressing the AUDIO CANCEL pushbutton switch located on the center pedestal.
The audio and visual signal is reset by pressing the RESET pushbutton switch located on CALLS/SELCAL panel 423VU.
A test can be performed by means of the SELCAL decoder on the SELCAL test pushbutton switch.
This test checks out the system for correct operation.

6. Associated Peripheral Systems
The SELCAL decoder is connected with :
- the radio communication systems : VHF1 - VHF2 - VHF3 - HF1 and HF2
- the FWC (flight warning computer) system.




SELCAL System - Principle
Figure 003

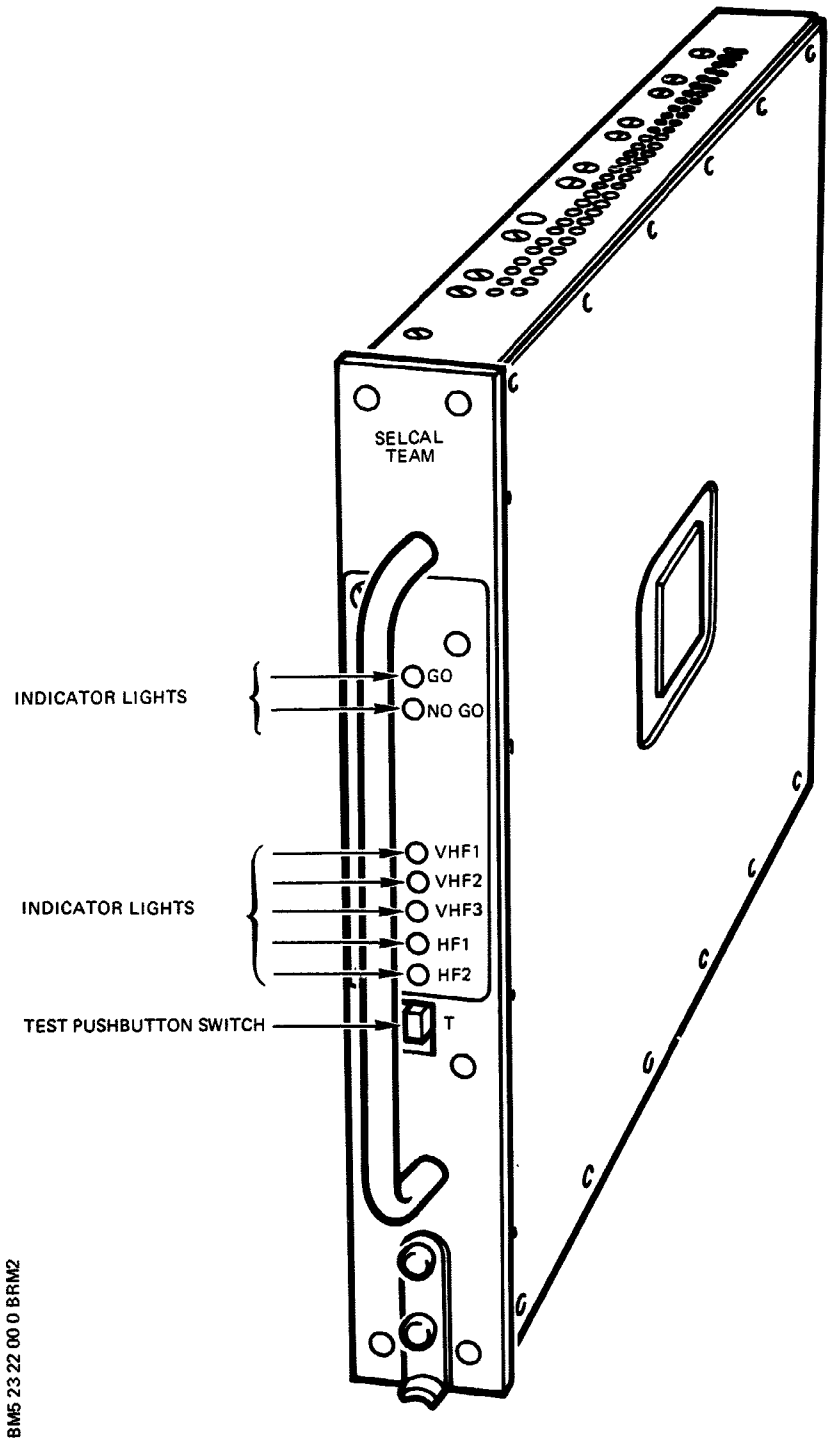



SELCAL System - Block Diagram
Figure 004

7. SELCAL Decoder
(Ref. Fig. 005)

A. Description
Its case size is 1MCU in compliance with ARINC specification 600.
The face features :
- a green GO indicator light
- a red NO-GO warning light
- five amber warning lights representing the various channels
- a T (test) pushbutton switch
- a handle.
The back is equipped with an electrical connector in compliance with ARINC 600.

B. Characteristics
Number of inputs : 5
Input impedance : 10,000 ohms
Input signal level : from 0.07 volts to 3.2 volts.




SELCAL Decoder
Figure 005

C. Operation

(Ref. Fig. 006)

The signal from the various communication systems is applied, depending on its origin, to one of the five input channels (VHF1, VHF2, VHF3, HF1 or HF2).

This signal is then fed to an input compressor (C1 to C5) and filtered (F1 to F5).

The input compressor, comprising a high-gain amplifier and a deviation detector amplifier which controls a variable resistor, delivers a constant AF signal whatever the input signal level.

The filter eliminates all the frequencies greater than 3 KHz for further signal processing through digital filtering. The five filter outputs are connected to an analog/digital converter.

This converter fulfills two functions :

- it continuously scrutinizes, under processing unit control, the five analog inputs in order to select the channel on which a call is transmitted (multiplexing function)
- it ensures conversion of analog signals (compressor and filter outputs) into digital signals (8 bits) so that they can be used by the processing unit.

The digital signals are transmitted to the processing unit through an 8-bit data bus. Digital signals are processed by the processing unit which must :

- acknowledge whether the received signal code corresponds to the
- code selected by means of the code selection panel (paragraph 7).
- control call indicating

The processing unit comprises :

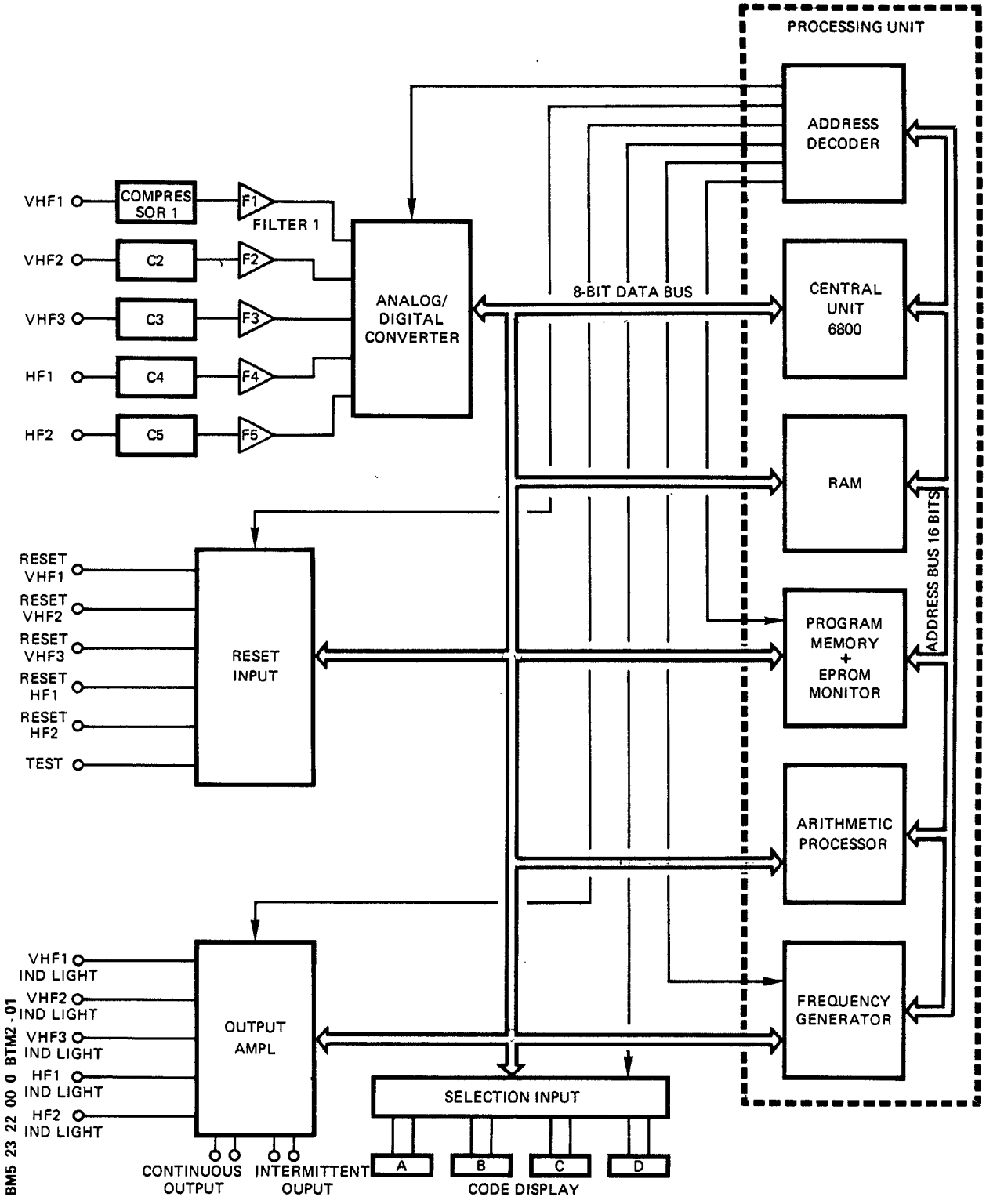
- a microprocessor (central unit 6800)
- an arithmetic processor (ensuring generation of computations necessary to signal acknowledgement
- a RAM circuit
- a program memory circuit (in which the software is recorded)
- a frequency generator (time base clock)
- an address decoder

The signal validity is acknowledged as follows :

The five input channels are scrutinized by the converter, under the processing unit control, during a cycle of 480 ms, i.e. : 96 ms x 5.

During each scanning cycle of 96 ms, 320 samples of the signal are processed by the processing unit. The latter checks if the received signal is representative of the first frequency selected by means of the code selection panel :

- if the signal is not representative, the scanning cycle selects the next channel
- if the signal is representative, 320 new samples of the signal are processed to check if they are representative of the second displayed frequency
- if they are not representative, the scanning cycle selects the next channel
- if they are representative, this means that the first two frequencies of the received code correspond to the frequencies of the code displayed by means of the code selection panel.




SELCAL System - Block Diagram
Figure 006

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PIA



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This first part of information is stored in memory. Time delay is activated and the channel scanning cycle starts again. At the end of the time delay, the channel on which the first part of the code has been detected is scrutinized again to search frequencies corresponding to the second part of the code following the process used for the first part detection. When the four frequencies are validated, the two parts of information are stored in memory.
The RAM state controls the output amplifier stage which then delivers the means necessary to aural and visual call indicating.
Reset is controlled by acting on the reset circuits.

D. Test

The SELCAL system can be checked for correct operation in the flight compartment or by means of the decoder.
The test circuits are built in the decoder : they check the inputs/outputs, computation unit and operation by sending the frequencies corresponding to the displayed letters to the AF inputs.

(1)Test in flight compartment

The test is initiated by operating the SELCAL test pushbutton switch 5RW located on maintenance panel.

Phase 1 : All lights come on during 3 seconds approximately and then go off (light operational test)

Phase 2 : The following lights : HF2, HF1, VHF3, VHF2, VHF1 come on and then go off in succession (test of internal operation and correct light control)

Phase 3 : The following lights come on in succession : VHF1, VHF2, VHF3, HF1 and HF2. These lights remain on for 3 seconds approximately and then go off (test of call detection on each channel).
In the event of a fault, the light corresponding to the faulty channel does not come on.

(2)Test using SELCAL decoder

The face of the SELCAL decoder comprises repeater warning lights, a test pushbutton switch and GO/NO-GO test report lights.
Test is initiated by acting on the test pushbutton switch located on the face.

Phase 1 : All lights come on during 3 seconds approximately and then go off. NO-GO light comes on and then goes off. GO light comes on and goes off (light operational test).

Phase 2 : The following lights come on and then go off in succession : HF2, HF1, VHF3, VHF2 and VHF1. GO and NO-GO lights come on simultaneously (test of internal operation and correct control of lights).

Phase 3 : GO NO-GO lights come on in succession and then VHF1, VHF2, VHF3, HF1 and HF2.
Only report GO (or NO-GO) light remains on.
These lights remain on during 3 seconds approximately and then go off (test of call detection on each channel).

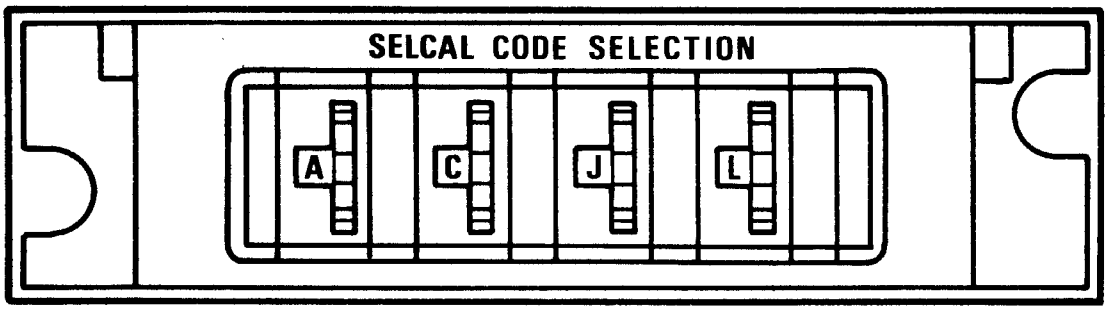
This test is identical to the test performed in the flight compartment but the GO or NO-GO result includes the sum of all performed checks.

8. SELCAL Code Selection Panel
(Ref. Fig. 007)

A. Description
The SELCAL code selection panel is a rectangular case in compliance with ARINC 714.
The face features :
- four knurled knobs for selection of a code made up of four letters among : A B C D E F G H J K L M P Q R S
- a Plexiglas cover to protect selected code display and enabling its reading. The back is equipped with a round connector for connection to the aircraft electrical network.

B. Operation
(Ref. Fig. 008)
Each knurled knob ensures ground connection or opening of the different circuits, following the BCD code, thus enabling generation of the different frequencies assigned to the considered codes.
The control logic is given in figure (Ref. Fig. 008). The zero state corresponding to circuit operation is obtained by connecting the circuit to ground or for a voltage which may reach +3.5 V.
State 1, corresponding to an inoperative circuit, is obtained by an opening of the resistor circuit greater than 50,000 ohms. Letter-frequency assignment is shown in the following table.

| DESIGNATION | FREQUENCY | BCD CODE |
|---|---|---|
| | | 8 4 2 1 |
| A | 312.6 | 0 0 0 1 |
| B | 346.7 | 0 0 1 0 |
| C | 384.6 | 0 0 1 1 |
| D | 426.6 | 0 1 0 0 |
| E | 473.2 | 0 1 0 1 |
| F | 524.8 | 0 1 1 0 |
| G | 582.1 | 0 1 1 1 |
| H | 645.7 | 1 0 0 0 |
| J | 716.1 | 1 0 0 1 |
| K | 794.3 | 1 0 1 0 |
| L | 881 | 1 0 1 1 |
| M | 977.2 | 1 1 0 0 |
| P | 1083.9 | 1 1 0 1 |
| Q | 1202.3 | 1 1 1 0 |
| R | 1333.5 | 1 1 1 1 |
| S | 1479.1 | 0 0 0 0 |

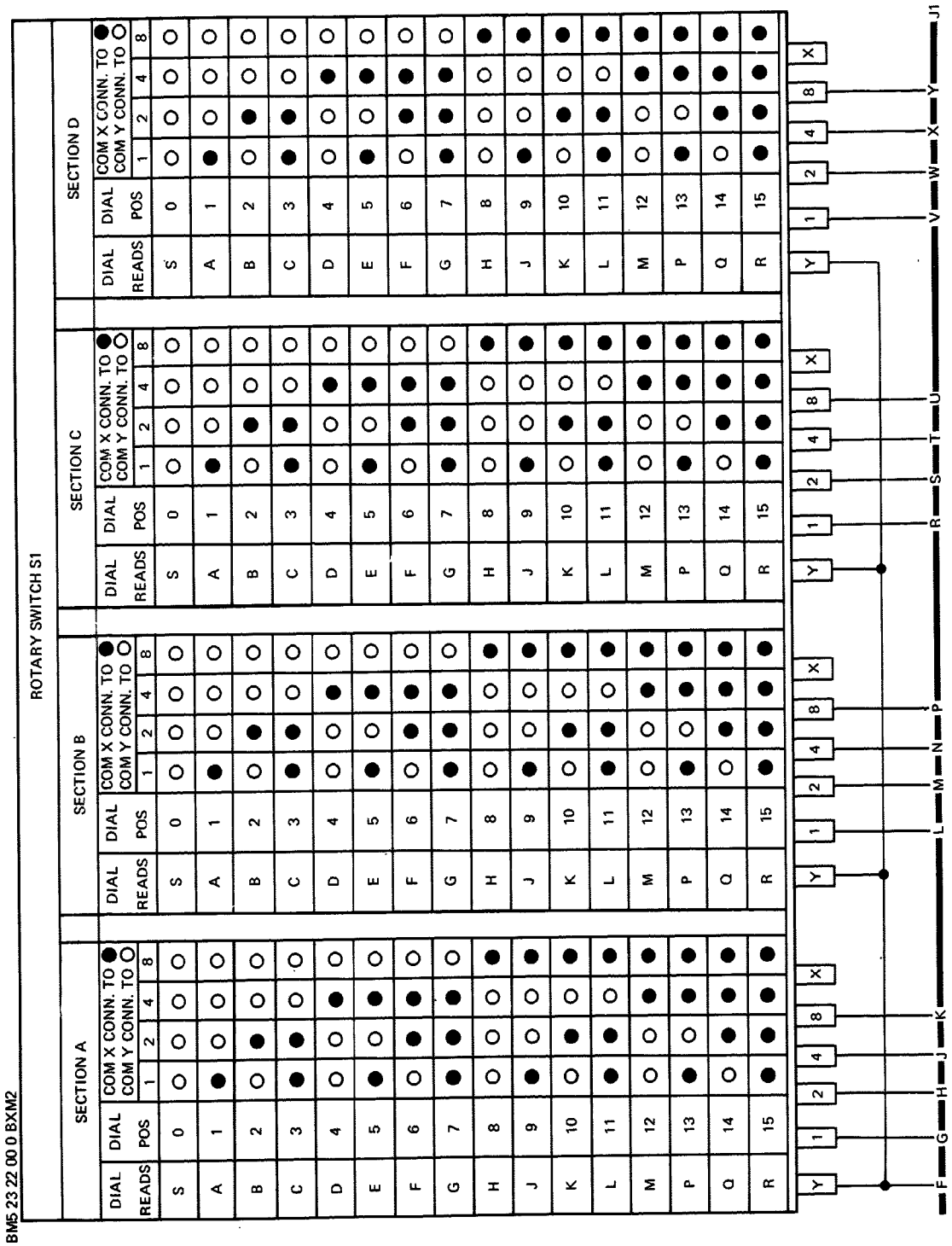



BM5 23 22 00 0 BVM2 00

SELCAL Code Selection Panel
Figure 007



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SELCAL Code Selection Panel - Operating Diagram
Figure 008

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# SELECTIVE CALLING SYSTEM - DESCRIPTION AND OPERATION

## 1. General

The SELCAL (Selective Calling) system provides visual and aural indicating of calls transmitted by ground stations and received by the aircraft equipment. These calls are transmitted by the ground to the aircraft in the communication radio frequencies.
The communication channels which can be used are : VHF1, VHF2, VHF3 and HF1 and HF2.

## 2. Component Location

(Ref. Fig. 001)

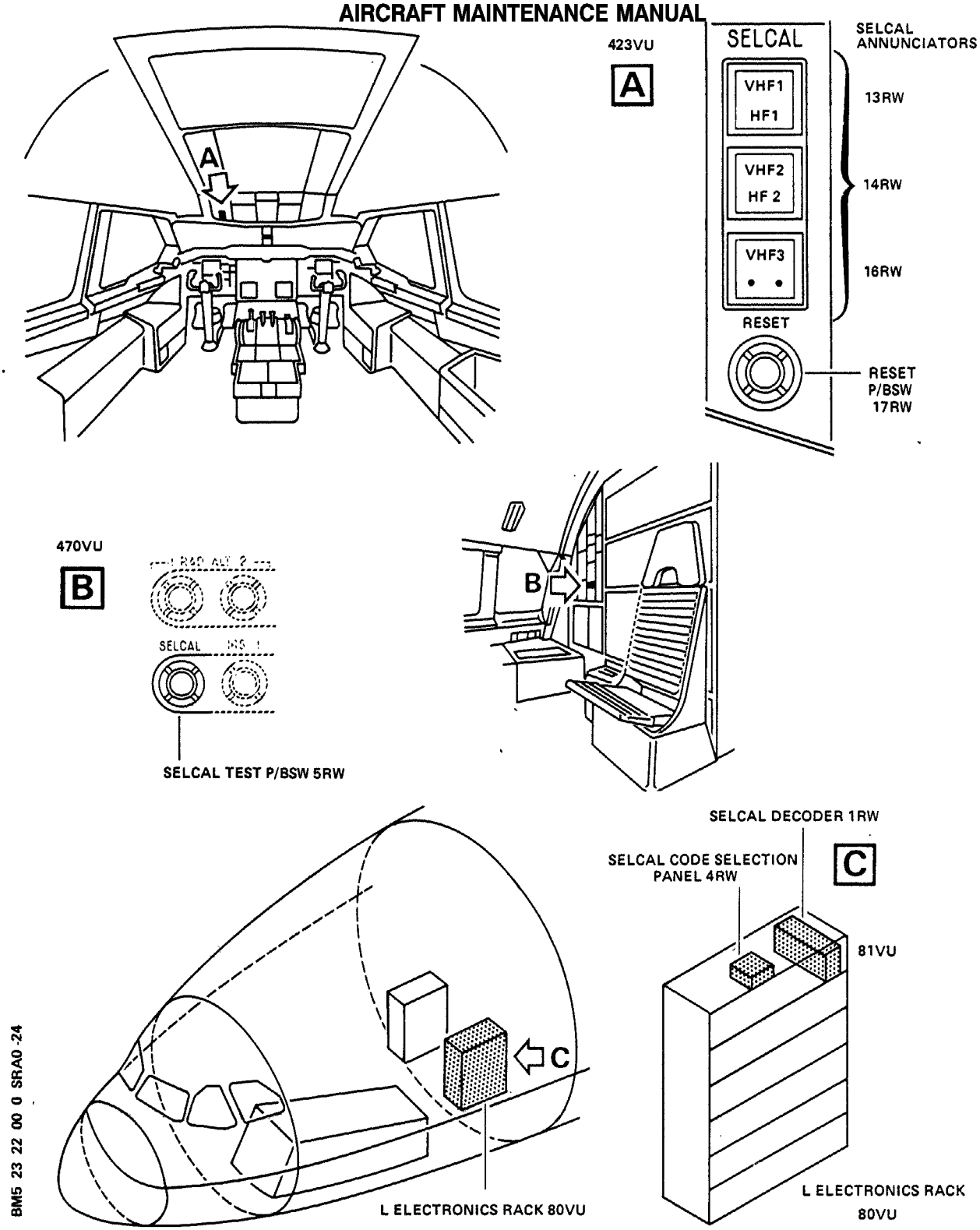
| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 1RW | DECODER-SELCAL | 81VU | 121 | 121BL | 23-22-34 |
| 4RW | CODE SELECTION PNL-SELCAL | | 121 | 121BL | 23-22-12 |
| 5RW | P/BSW-SELCAL TEST | 470VU | 212 | | |
| 13RW | ANNUNCIATOR-SELCAL/VHF1/HF1 | 423VU | 211 | | |
| 14RW | ANNUNCIATOR-SELCAL/VHF2/HF2 | 423VU | 211 | | |
| 16RW | ANNUNCIATOR-SELCAL/VHF3 | 423VU | 211 | | |
| 17RW | P/BSW/RESET | 423VU | 211 | | |

## 3. System Description

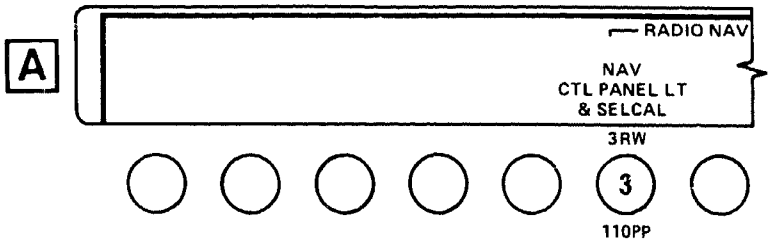
The SELCAL system comprises :
- a SELCAL decoder
- a code selection panel
- three double legend annunciators
- a SELCAL test pushbutton switch
- a RESET pushbutton switch.

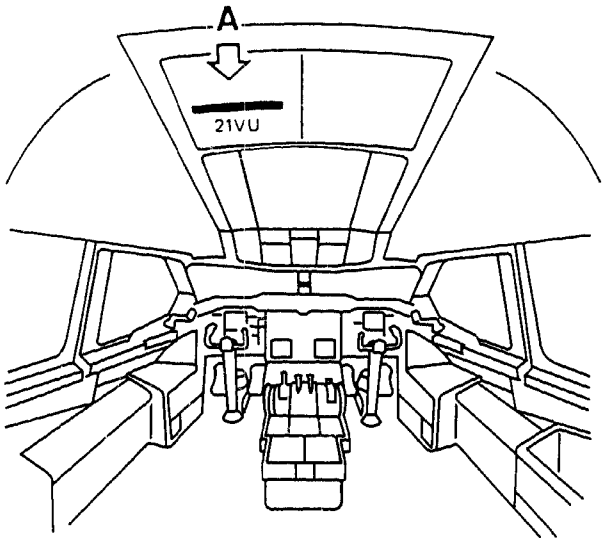
## 4. Electrical Power Supply

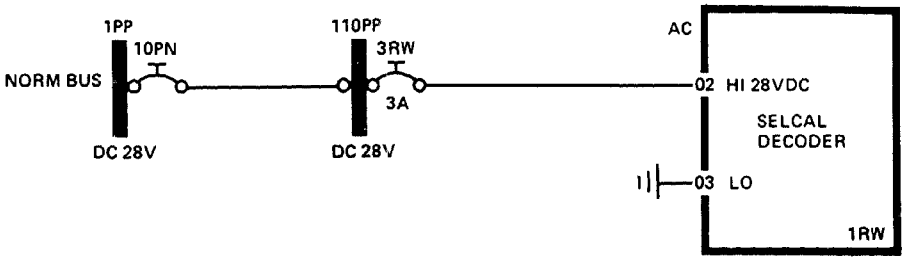
(Ref. Fig. 002)
The SELCAL system is supplied with 28VDC from Normal busbar 1PP by busbar 110PP through 3A circuit breaker 3RW located on circuit breaker panel 21VU.




SELCAL System - Component Location
Figure 001




BM5 23 22 00 0 TGC0 07 12
DM5

SELCAL System - Electrical Power Supply
Figure 002

5. Operation
(Ref. Fig. 003)

A. Ground System
The ground system transmits, through VHF or HF transmitters, a selective calling code made up of two consecutive pulses with each pulse containing two simultaneously transmitted frequencies for call differentiation.
A call is the code transmitted once only.

B. Aircraft System
(Ref. Fig. 004)
The call signals transmitted by the ground stations (VHF or HF) are received and detected by the aircraft receivers. After detection, these signals are applied to the SELCAL decoder inputs (5).
The SELCAL decoder continuously scrutinizes the five inputs on which calls may be present and determines whether received signals are made up of frequencies corresponding to the aircraft code. This code is selected by means of the code selection panel.
In this case, an audio signal is activated and the call indicator light corresponding to the receiving system (VHF1 - VHF2 - VHF3 - HF1 - HF2) is on.
The audio signal is reset by pressing the AUDIO CANCEL pushbutton switch located on the center pedestal.
The audio and visual signal is reset by pressing the RESET pushbutton switch located on CALLS/SELCAL panel 423VU.
A test can be performed by means of the SELCAL decoder on the SELCAL test pushbutton switch.
This test checks out the system for correct operation.

6. Associated Peripheral Systems
The SELCAL decoder is connected with :

R **ON A/C 105-200,

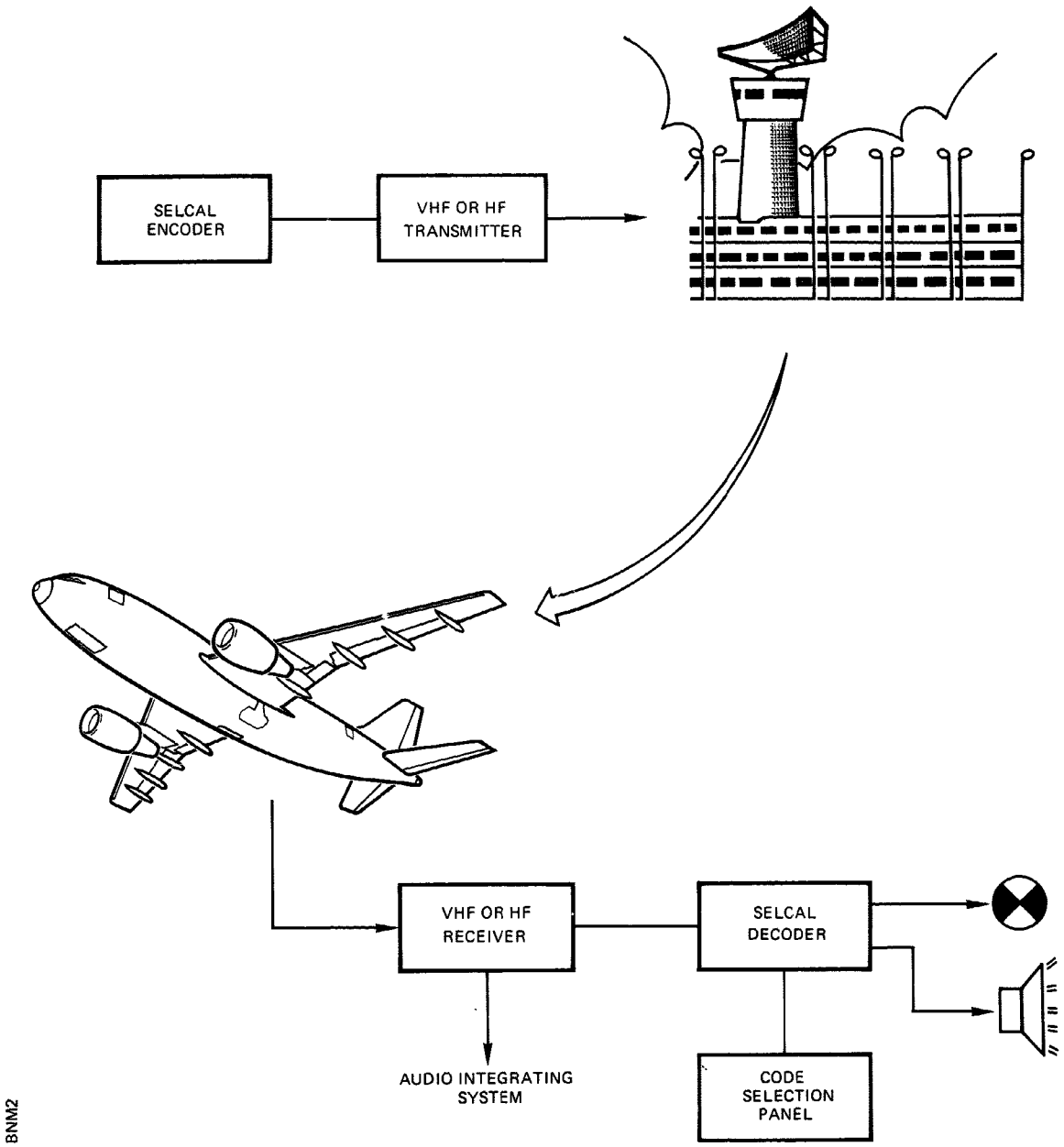
- the radio communication systems : VHF1 - VHF2 - VHF3 - HF1.

R **ON A/C 001-100,

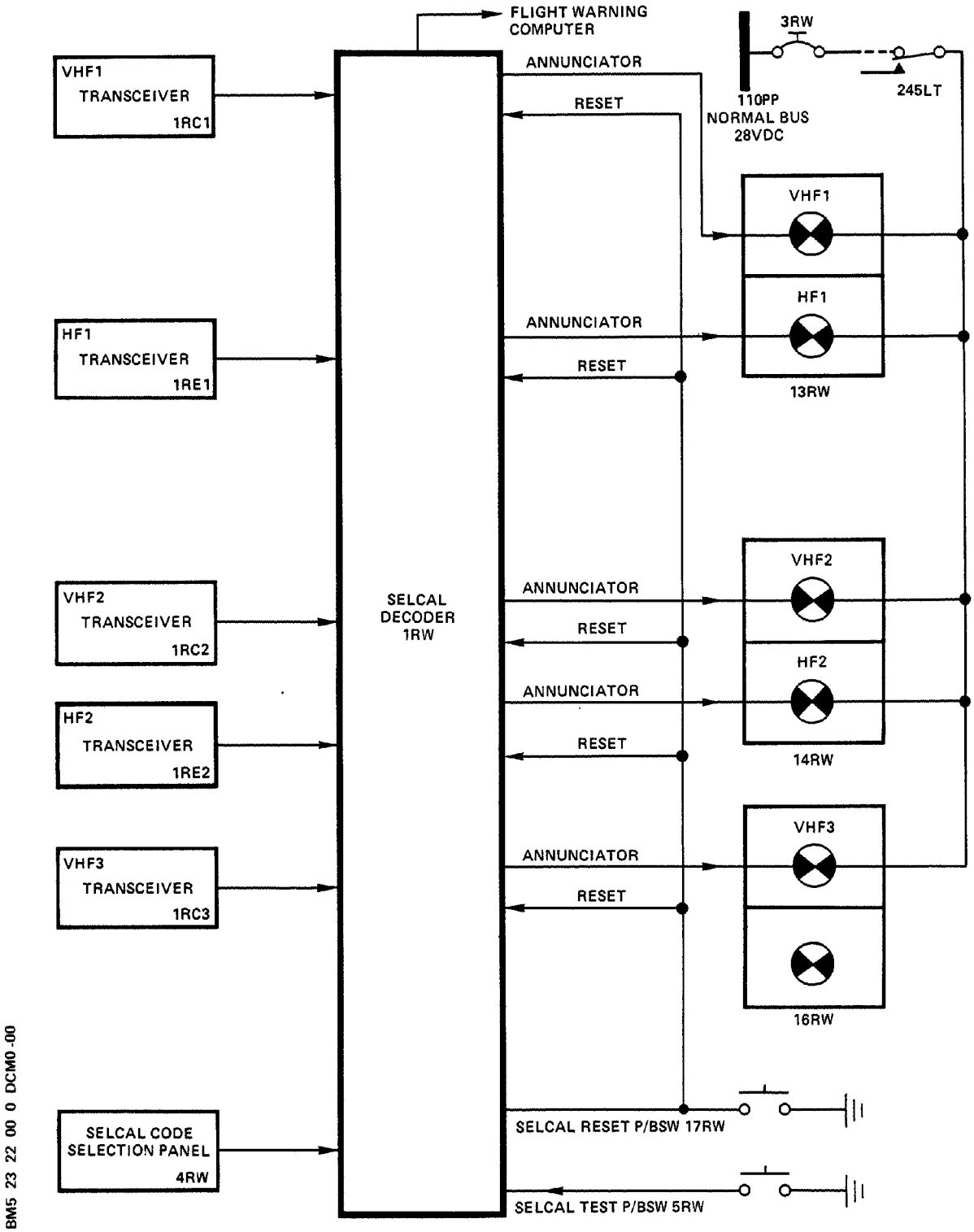
- the radio communication systems : VHF1 - VHF2 - VHF3 - HF1 and HF2.

R **ON A/C 001-100, 105-200,

- the FWC (flight warning computer) system.




SELCAL System - Principle
Figure 003




SELCAL System - Block Diagram
Figure 004

7. SELCAL Decoder

R **ON A/C 105-200,

(Ref. Fig. 005)

R **ON A/C 001-100,

(Ref. Fig. 006)

R **ON A/C 105-200,

A. Description
The SELCAL decoder conforms to ARINC specification 714.
Its case size is 1MCU in compliance with ARINC specification 600.
The face features :
- a green GO indicator light
- a red NO-GO warning light
- five amber warning lights representing the various channels
- a T (test) pushbutton switch
- a handle.
The back is equipped with an electrical connector in compliance with ARINC 600.

B. Characteristics
Number of inputs : 5
Input impedance : 10,000 ohms
Input signal level : from 0.07 volts to 3.2 volts.

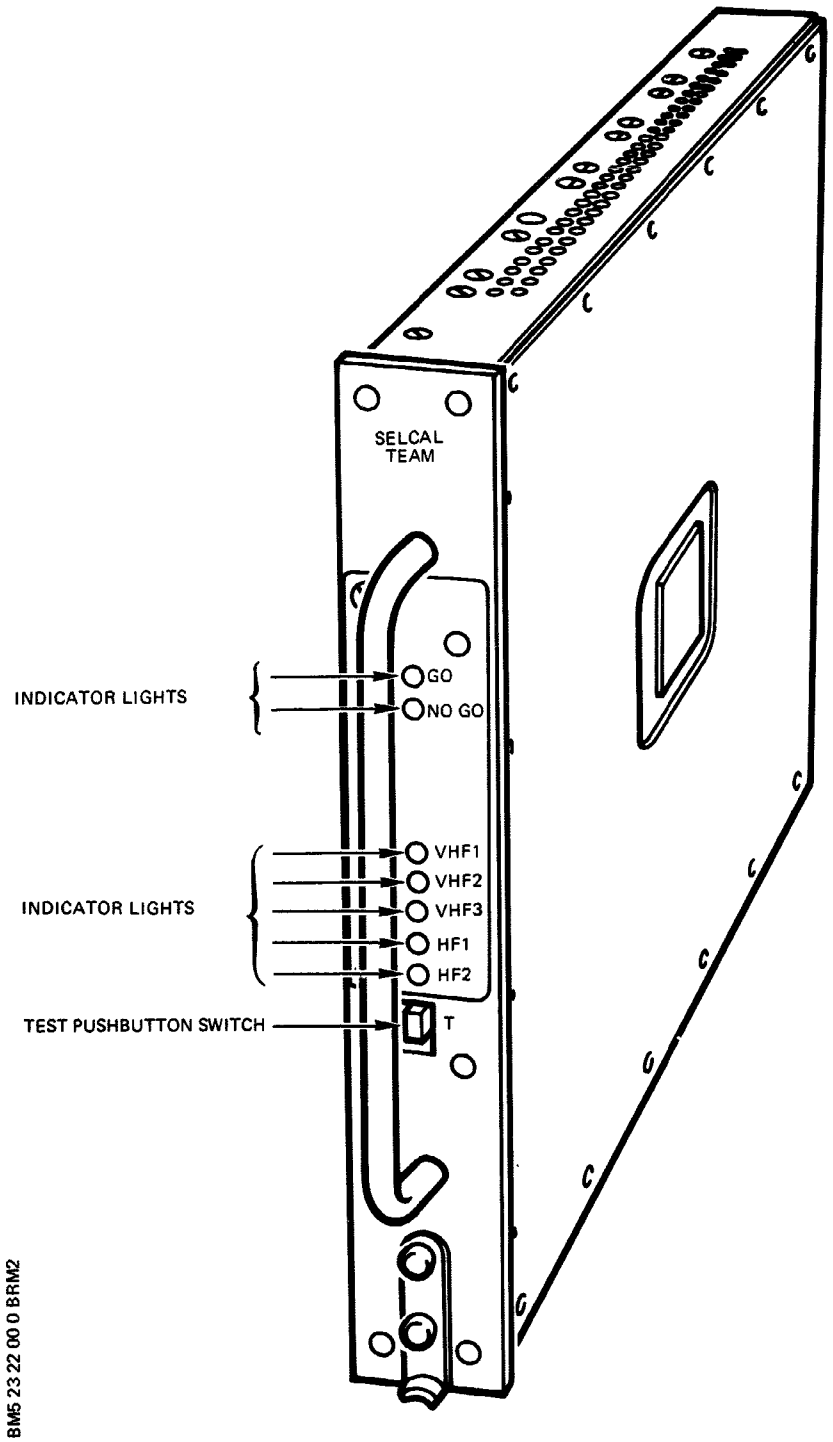
C. Operation

R **ON A/C 001-100,

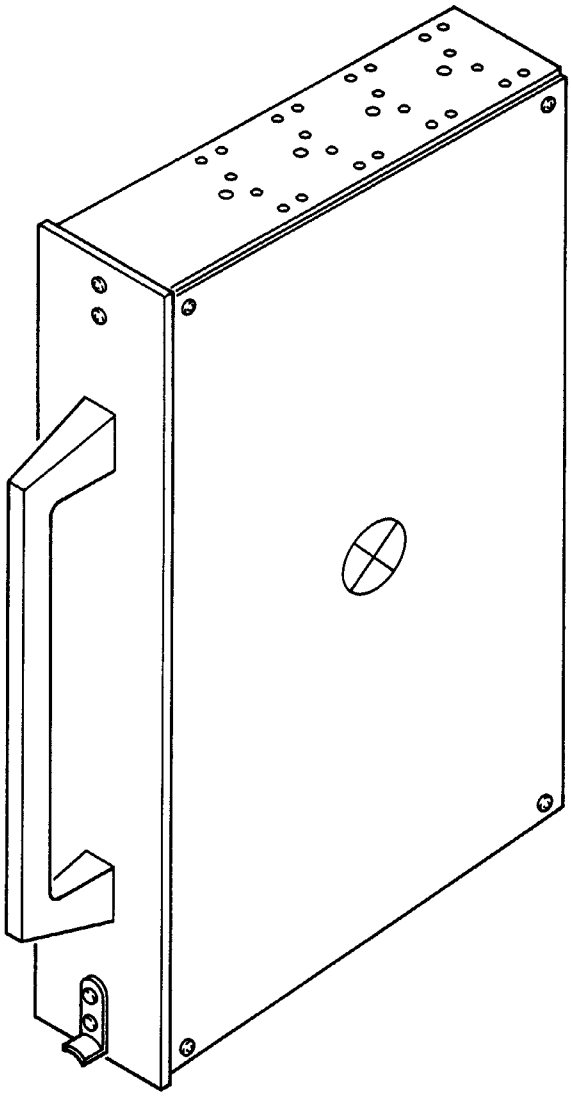
A. Description
The SELCAL decoder conforms to ARINC specification 714.
Its case size is 1MCU in compliance with ARINC specification 600.
The face features :
- a cover
- a handle.
The back is equipped with an electrical connector in compliance with ARINC 600.

B. Characteristics
Number of inputs : 5
Input impedance : 10 K ohms
Input signal level : from 0.07 to 3 volts.

C. Operation




SELCAL Decoder
Figure 005



BM5 23 22 00 0 AEM2.00

SELCAL Decoder
Figure 006

R **ON A/C 105-200,

(Ref. Fig. 007)

R **ON A/C 001-100,

(Ref. Fig. 008)

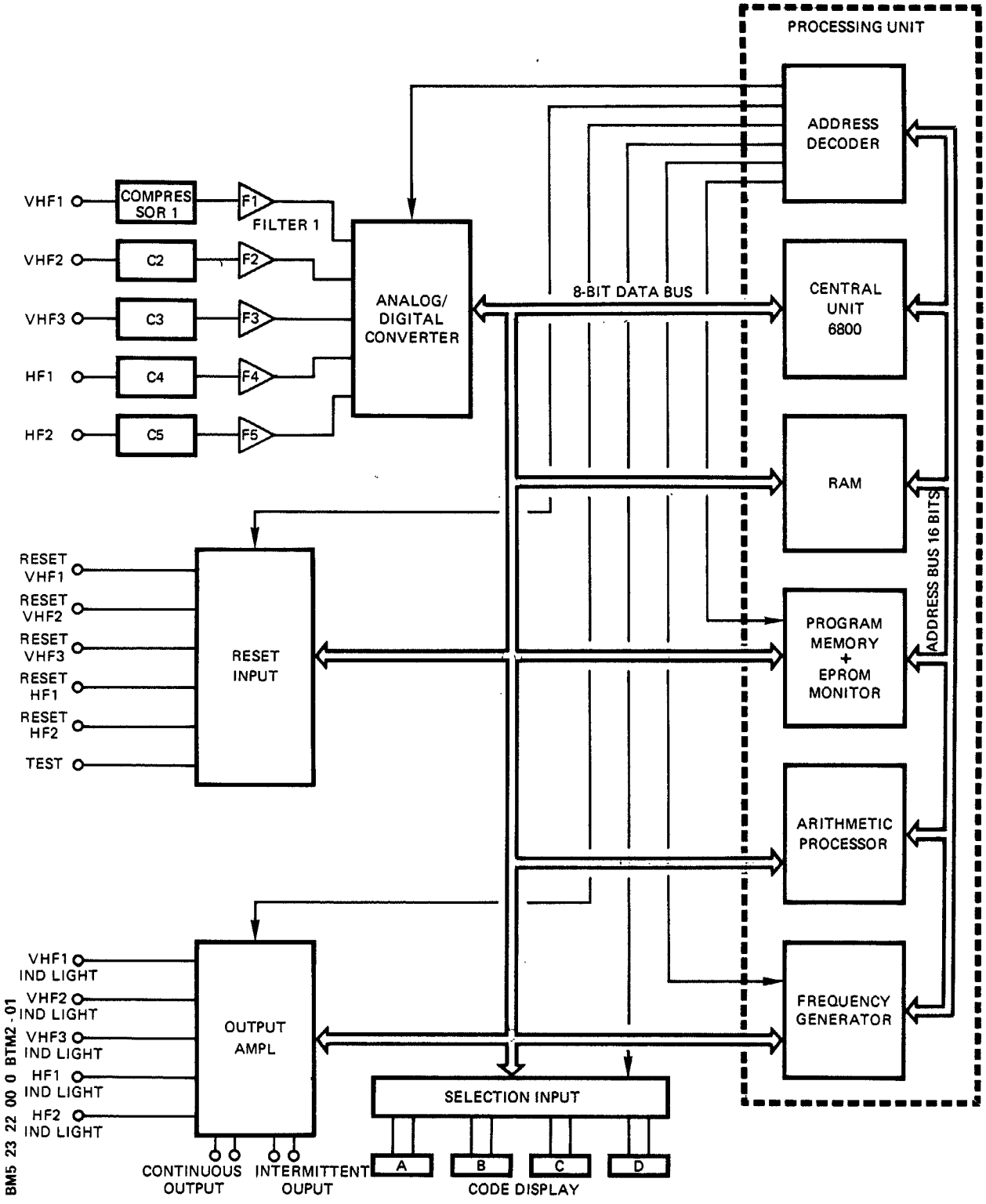
R **ON A/C 105-200,

The signal from the various communication systems is applied, depending on its origin, to one of the five input channels (VHF1, VHF2, VHF3, HF1 or HF2).
This signal is then fed to an input compressor (C1 to C5) and filtered (F1 to F5).
The input compressor, comprising a high-gain amplifier and a deviation detector amplifier which controls a variable resistor, delivers a constant AF signal whatever the input signal level.
The filter eliminates all the frequencies greater than 3 KHz for further signal processing through digital filtering. The five filter outputs are connected to an analog/digital converter.
This converter fulfills two functions :
- it continuously scrutinizes, under processing unit control, the five analog inputs in order to select the channel on which a call is transmitted (multiplexing function)
- it ensures conversion of analog signals (compressor and filter outputs) into digital signals (8 bits) so that they can be used by the processing unit.

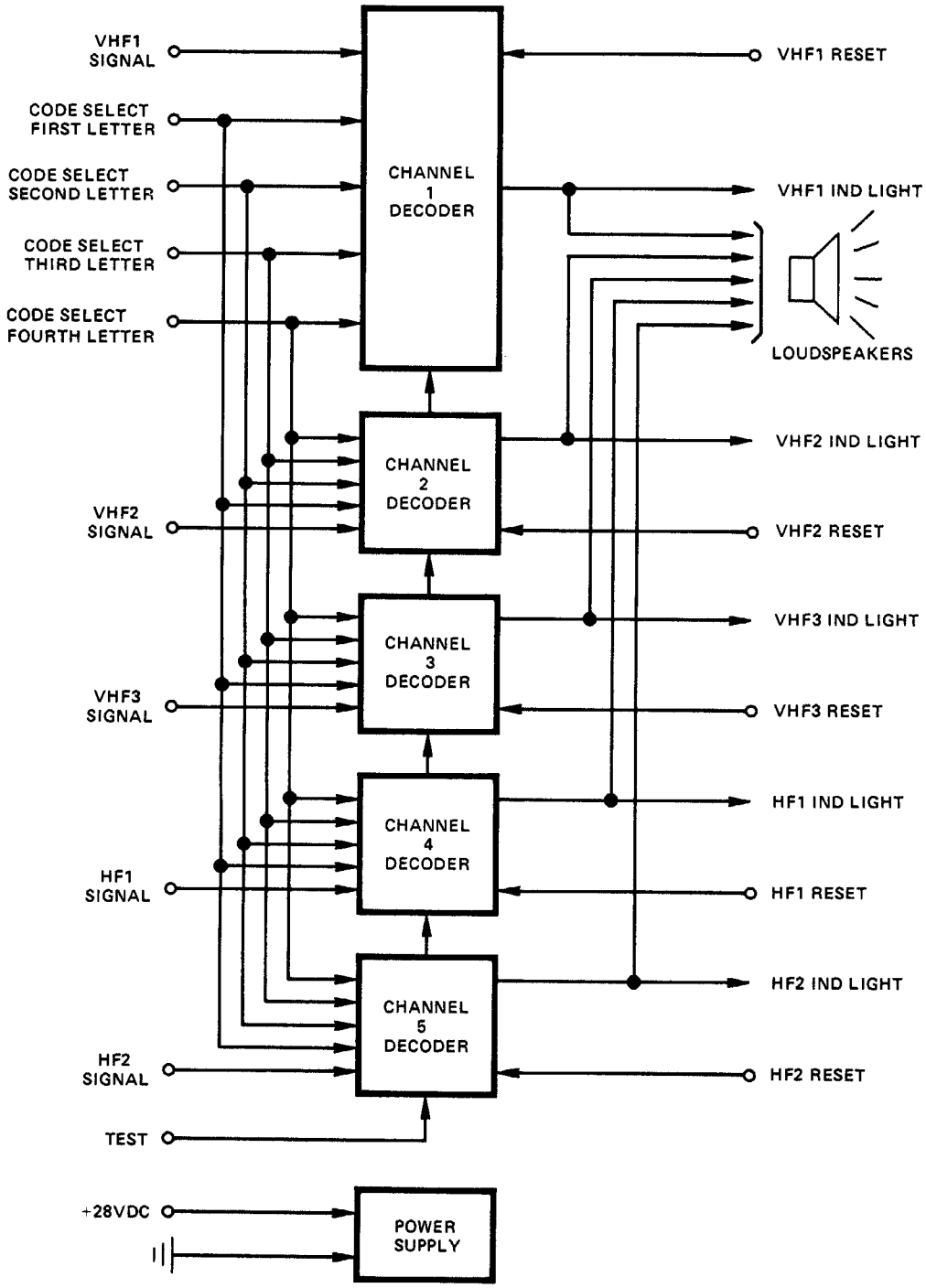
The digital signals are transmitted to the processing unit through an 8-bit data bus. Digital signals are processed by the processing unit which must :
- acknowledge whether the received signal code corresponds to the
- code selected by means of the code selection panel (paragraph 7).
- control call indicating

The processing unit comprises :
- a microprocessor (central unit 6800)
- an arithmetic processor (ensuring generation of computations necessary to signal acknowledgement
- a RAM circuit
- a program memory circuit (in which the software is recorded)
- a frequency generator (time base clock)
- an address decoder

The signal validity is acknowledged as follows :
The five input channels are scrutinized by the converter, under the processing unit control, during a cycle of 480 ms, i.e. : 96 ms x 5.
During each scanning cycle of 96 ms, 320 samples of the signal are processed by the processing unit. The latter checks if the received signal is representative of the first frequency selected by means of the code selection panel :
- if the signal is not representative, the scanning cycle selects the




SELCAL System - Block Diagram
Figure 007




BM5 23 22 00 0 BWM2 - 00

SELCAL System - Block Diagram
Figure 008

next channel
- if the signal is representative, 320 new samples of the signal are processed to check if they are representative of the second displayed frequency
- if they are not representative, the scanning cycle selects the next channel
- if they are representative, this means that the first two frequencies of the received code correspond to the frequencies of the code displayed by means of the code selection panel.

This first part of information is stored in memory. Time delay is activated and the channel scanning cycle starts again. At the end of the time delay, the channel on which the first part of the code has been detected is scrutinized again to search frequencies corresponding to the second part of the code following the process used for the first part detection. When the four frequencies are validated, the two parts of information are stored in memory.
The RAM state controls the output amplifier stage which then delivers the means necessary to aural and visual call indicating.
Reset is controlled by acting on the reset circuits.

D. Test
The SELCAL system can be checked for correct operation in the flight compartment or by means of the decoder.
The test circuits are built in the decoder : they check the inputs/outputs, computation unit and operation by sending the frequencies corresponding to the displayed letters to the AF inputs.

(1)Test in flight compartment
The test is initiated by operating the SELCAL test pushbutton switch 5RW located on maintenance panel.
Phase 1 : All lights come on during 3 seconds approximately and then go off (light operational test)

R **ON A/C 001-100,

The signals are received the various communication systems: VHF1, VHF2, VHF3, HF1 and HF2.
The VHF1 (VHF2, VHF3, HF1, HF2) signal is applied to channel 1 (2, 4, 5 respectively) DECODER.
Each channel decoder receives the four letters of the aircraft code selected on the SELCAL code selection panel in BCD (Binary Coded Decimal) format.
The channel decoder functions are:
- acknowledge whether the received signal code corresponds to the code selected by the means of the SELCAL code selection panel (See Para. 8).
- control call indicating (See Para. 5).

The signal validity is acknowledged as follows.
The received signal is compared to the first two letters of the code selected :
- if the signal is not representative, this means that the first two codes of the received signal correspond to those of the aircraft code. Then,

the channel decoder processes, in a similar manner, the last two codes of the signal.

- if they are not representative, the signal is not valid.
- if they are representative, the four codes of the received signal are validated and the channel decoder delivers the means necessary to aural and visual call indicating.

Reset is controlled by acting on VHF1 (VHF2, VHF3, HF1, HF2) reset circuit.

D. Test

The SELCAL system can be checked for correct operation in the flight compartment.

The test circuits are built in the decoder : they check the inputs/outputs, computation unit and operation by sending the frequency codes corresponding to the four letters of the aircraft code selected on the SELCAL code selection panel.

(1)Test in flight compartment

The test is initiated by operating the SELCAL test pushbutton switch 5RW located on maintenance panel.

All SELCAL annunciators come on and remain on.

Then, by operating the RESET pushbutton switch 17RW located on panel 423VU, the SELCAL annunciators go off.

R **ON A/C 105-200,

Phase 2 : The following lights : HF2, HF1, VHF3, VHF2, VHF1 come on and then go off in succession (test of internal operation and correct light control)

Phase 3 : The following lights come on in succession : VHF1, VHF2, VHF3, HF1 and HF2. These lights remain on during 3 seconds approximately and then go off (test of call detection on each channel). In the event of a fault, the light corresponding to the faulty channel does not come on.

(2)Test using SELCAL decoder

The face of the SELCAL decoder comprises repeater warning lights, a test pushbutton switch and GO/NO-GO test report lights.

Test is initiated by acting on the test pushbutton switch located on the face.

Phase 1 : All lights come on during 3 seconds approximately and then go off. NO-GO light comes on and then goes off. GO light comes on and goes off (light operational test).

Phase 2 : The following lights come on and then go off in succession : HF2, HF1, VHF3, VHF2 and VHF1. GO and NO-GO lights come on simultaneously (test of internal operation and correct control of lights).

Phase 3 : GO NO-GO lights come on in succession and then VHF1, VHF2, VHF3, HF1 and HF2.

Only report GO (or NO-GO) light remains on.

These lights remain on during 3 seconds approximately and then go off (test of call detection on each channel).

This test is identical to the test performed in the flight compartment but the GO or NO-GO result includes the sum of all performed checks.

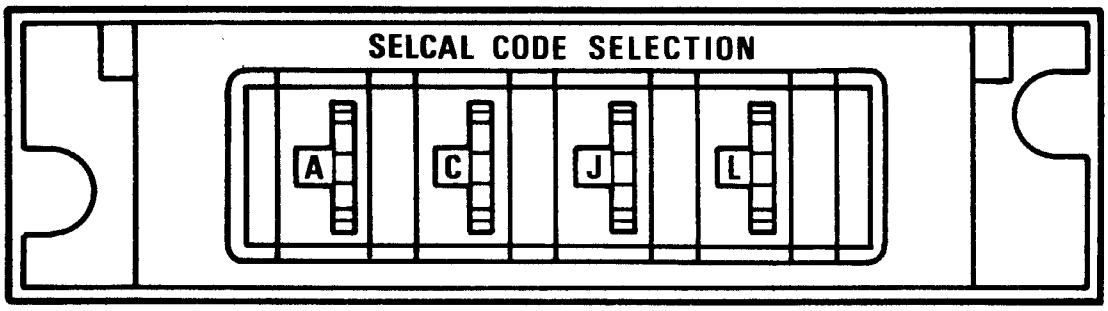
R **ON A/C 001-100, 105-200,

8. SELCAL Code Selection Panel
(Ref. Fig. 009)

A. Description
The SELCAL code selection panel is a rectangular case in compliance with ARINC 714.
The face features :
- four knurled knobs for selection of a code made up of four letters among : A B C D E F G H J K L M P Q R S
- a Plexiglas cover to protect selected code display and enabling its reading. The back is equipped with a round connector for connection to the aircraft electrical network.

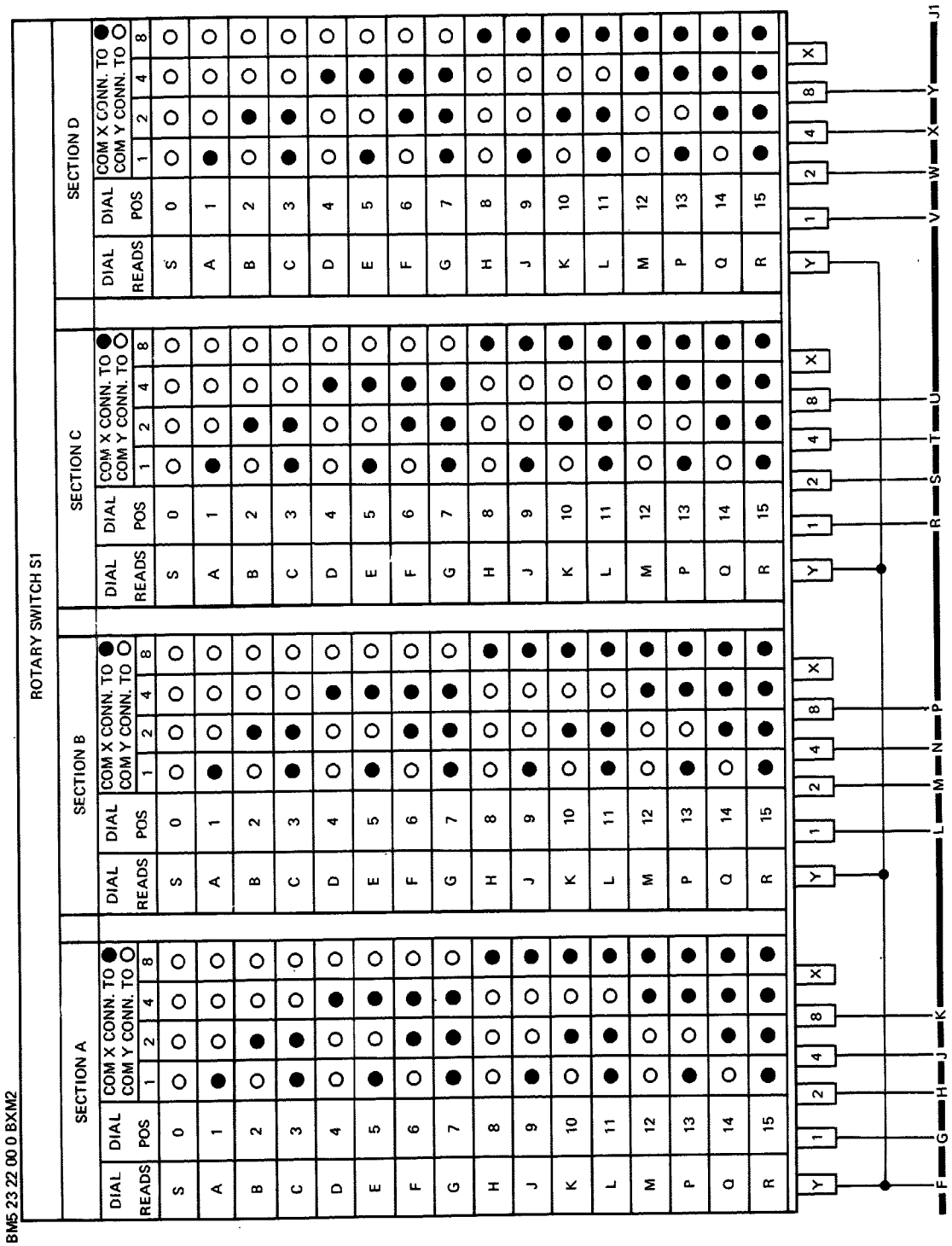
B. Operation
(Ref. Fig. 010)
Each knurled knob ensures ground connection or opening of the different circuits, following the BCD code, thus enabling generation of the different frequencies assigned to the considered codes.
The control logic is given in figure (Ref. Fig. 010). The zero state corresponding to circuit operation is obtained by connecting the circuit to ground or for a voltage which may reach +3.5 V.
State 1, corresponding to an inoperative circuit, is obtained by an opening of the resistor circuit greater than 50,000 ohms. Letter-frequency assignment is shown in the following table.

| DESIGNATION | FREQUENCY | BCD CODE |
|---|---|---|
| | | 8 4 2 1 |
| A | 312.6 | 0 0 0 1 |
| B | 346.7 | 0 0 1 0 |
| C | 384.6 | 0 0 1 1 |
| D | 426.6 | 0 1 0 0 |
| E | 473.2 | 0 1 0 1 |
| F | 524.8 | 0 1 1 0 |
| G | 582.1 | 0 1 1 1 |
| H | 645.7 | 1 0 0 0 |
| J | 716.1 | 1 0 0 1 |
| K | 794.3 | 1 0 1 0 |
| L | 881 | 1 0 1 1 |
| M | 977.2 | 1 1 0 0 |
| P | 1083.9 | 1 1 0 1 |
| Q | 1202.3 | 1 1 1 0 |
| R | 1333.5 | 1 1 1 1 |
| S | 1479.1 | 0 0 0 0 |




BM5 23 22 00 0 BVM2 00

SELCAL Code Selection Panel
Figure 009




SELCAL Code Selection Panel - Operating Diagram
Figure 010

1. Operational Test

A. Reason for the Job
BITE test.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure
WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.

(1)Job set-up
- Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
- Make certain that electronics racks ventilation is correct.
- Close circuit breakers, particularly those associated with ECAM and SELCAL on overhead panel, and those associated with ANN LT TEST on rear panel.

(2)Test

R **ON A/C 101-200,

| ACTION | RESULT |
|---|---|
| 1. On rear panel, on AVIONICS SYS TEST panel 470VU<br>- press and release SELCAL test pushbutton switch 5RW | On panel 423VU, automatic sequence in 3 phases starts :<br>- 1st phase : all SELCAL annunciators come on for 3 seconds and then go off<br>- 2nd phase : SELCAL annunciators come on and go off successively<br>- 3rd phase : intermittent buzzer sounds. SELCAL annunciators come on successively, remain on for 3 seconds and then go off. Intermittent buzzer stops. |

R **ON A/C 001-100,

| ACTION | RESULT |
|---|---|
| 1. On rear panel, on AVIONICS SYS TEST panel 470VU | |

| ACTION | RESULT |
|---|---|
| - press and release SELCAL test pushbutton switch 5RW | On panel 423VU : All SELCAL annunciators come on and remain on. |
| 2. On panel 423VU<br>- press and release RESET pushbutton switch (17RW). | The SELCAL annunciators go off. |

R **ON A/C ALL

(3)Close-up
(a)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Restore system and aircraft to normal operating condition.

# SELCAL DECODER (1RW) - REMOVAL/INSTALLATION

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |
| Referenced Procedure<br>- 23-22-00, P. Block 501<br>(Ref. Fig. 401) | Selective Calling System |

## 2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breaker :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RAD-NAV & COM/NAV/CTL PNL LT & SELCAL | 3RW | 106/D 6 |

(2)Open access door 121BL and gain access to SELCAL decoder.

B. Removal

(1)Unscrew knurled nut (5) and free lug (4) on SELCAL decoder (3).
(2)Withdraw SELCAL decoder (3) from mount (1).
(3)Remove SELCAL decoder (3).
(4)Cap electrical connectors (2).

C. Installation

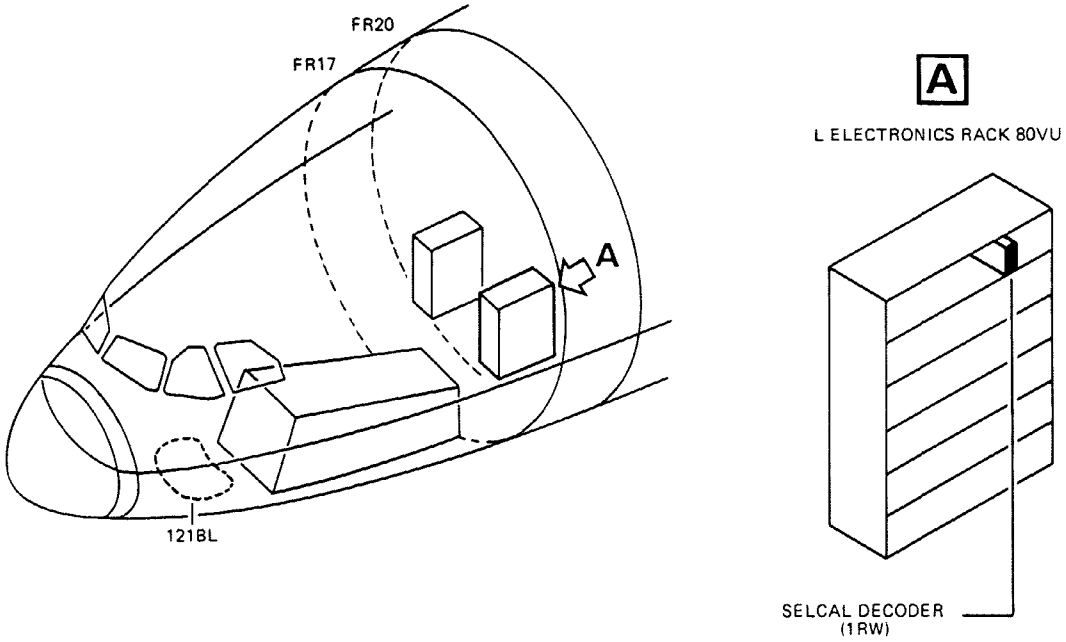
(1)Clean and inspect SELCAL decoder (3) interface.
(2)Remove blanking caps from connectors (2). Check for correct condition of electrical connectors.
(3)Position SELCAL decoder (3) on mount (1) and fully push.
(4)Position knurled nut (5) and tighten onto lug (4) of SELCAL decoder.
(5)Remove safety clip and tag and close circuit breaker 3RW.

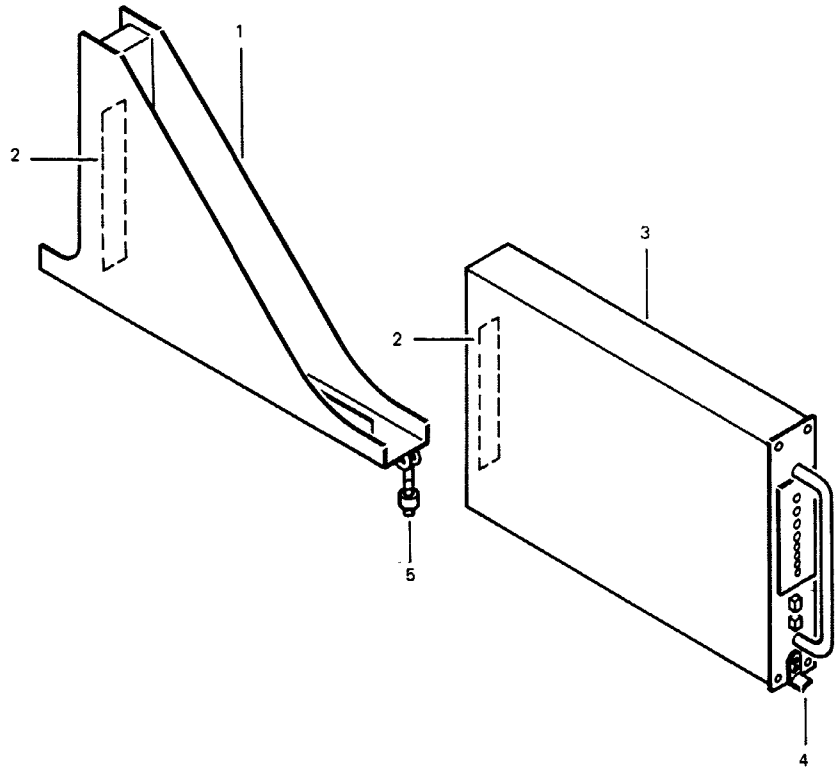
D. Test

Carry out an operational test of SELCAL system (Ref. 23-22-00, P. Block 501).

E. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close access door 121BL.




BM5 23 22 34 4 AAM2
DM5

SELCAL Decoder
Figure 401

## SELCAL CODE SELECTION PANEL (4RW) - REMOVAL/INSTALLATION

### 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |
| Referenced Procedure<br>- 23-22-00, P. Block 501<br>(Ref. Fig. 401) | Selective Calling System |

### 2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breaker :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RAD-NAV & COM/NAV/CTL PNL LT & SELCAL | 3RW | 106/D 6 |

(2)Open access door 121BL and gain access to SELCAL code selection panel.

B. Removal

(1)Unlock the Dzus fasteners (4).
(2)Withdraw SELCAL code selection panel (3) from housing (1).
(3)Disconnect connectors (5) and (2).
(4)Cap connectors (2) and (5).
(5)Remove SELCAL code selection panel (3).

C. Installation

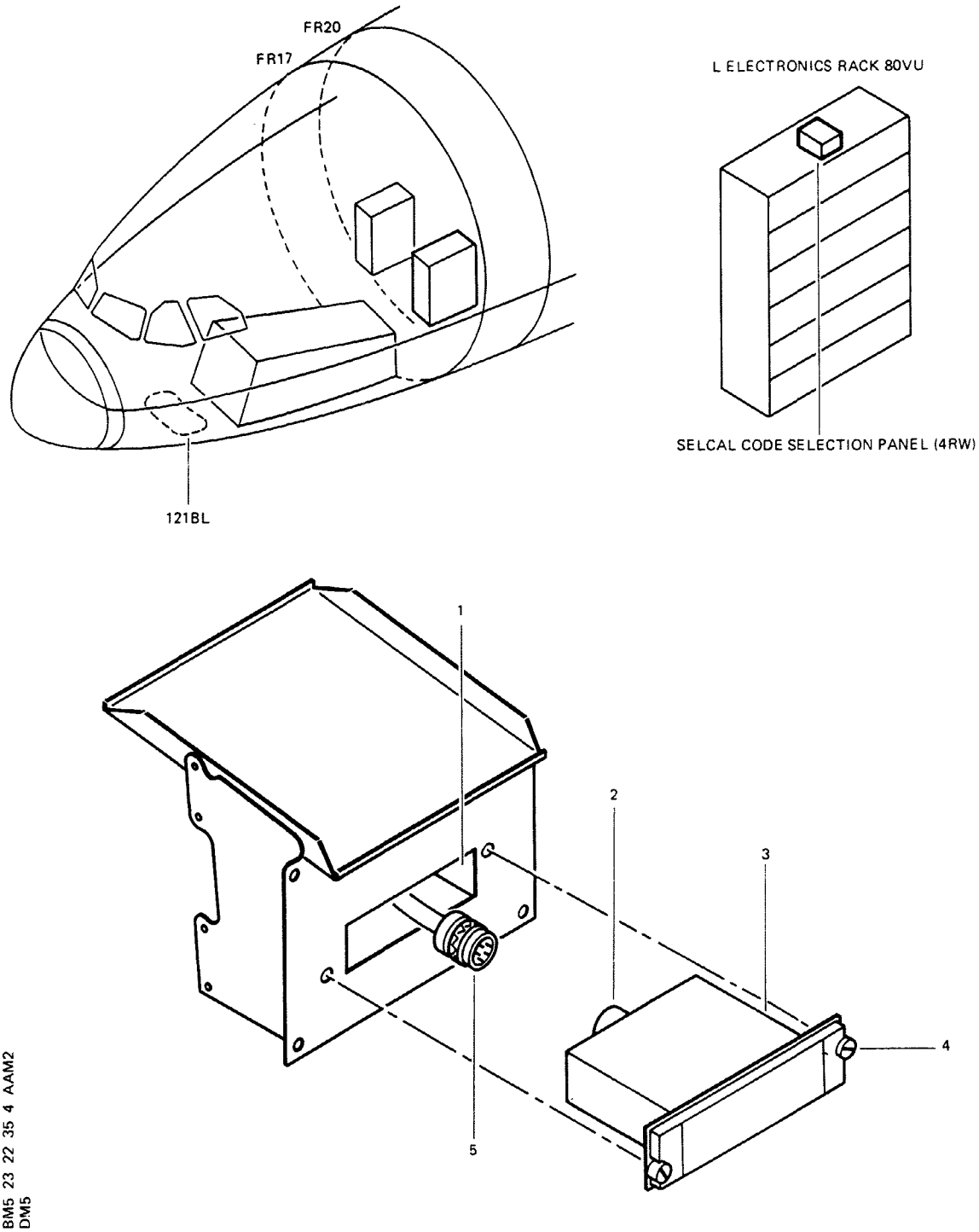
(1)Clean and inspect SELCAL code selection panel (3) interface and/or adjacent area.
(2)Remove blanking caps from electrical connectors (2) and (5). Check for correct condition of connectors.
(3)Connect connectors (5) and (2).
(4)Position SELCAL code selection panel in housing (1) and fully push.
(5)Attach SELCAL code selection panel (3) with Dzus fasteners (4).
(6)Remove safety clip and tag and close circuit breaker 3RW.

D. Tests

Check that code selected on SELCAL code selection panel is identical to aircraft SELCAL code.
Carry out operational test of SELCAL system (Ref. 23-22-00, P. Block 501).

E. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close access door 121BL.




SELCAL Code Selection Panel
Figure 401

# ARINC COMMUNICATION ADDRESSING AND REPORTING SYSTEM (ACARS)
# DESCRIPTION AND OPERATION

R 1. General

The ARINC communication addressing and reporting system (ACARS) is an addressable digital data link system which permits exchange of data and messages between an aircraft and a ground-based operation center over an ARINC VHF radio network.

2. Component Location

(Ref. Fig. 001)

| ITEM | DESIGNATION | PANEL | ZONE | ACCESS DOOR |
|---|---|---|---|---|
| 1RB | MANAGEMENT UNIT-ACARS | 81VU | 121 | 121BL |
| 15RB | P/BSW - ACARS | 463VU | 210 | |
| 16RB | CONTROL AND DISPLAY UNIT | 11VU | 210 | |
| 35RB | PRINTER - ACARS | 11VU | 210 | |

3. System Description

(Ref. Fig. 002)

The ACARS consists of :

A. One ACARS management unit, 1RB, which receives ground-to-air digital messages from the radio transceiver with which it is connected in the aircraft and controls the transmission of the air-to-ground digital messages through the same device.

B. On ACARS control and display unit, 16RB, which provides to the pilot the facilities necessary to enter test data such as, departure station, destination, estimated time of arrival, flight number, and miscellaneous messages into the ACARS system for transmission to a ground station.

C. Two management unit circuit breakers :
(1)10RB supplies management unit 115VAC power.
(2)12RB supplies management unit 28VDC power.

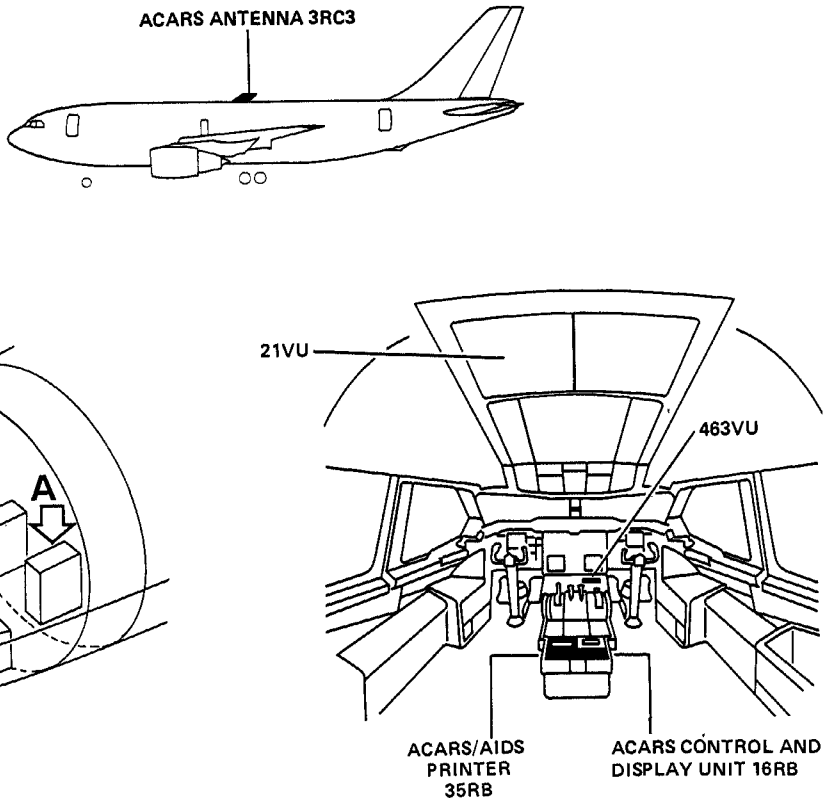
D. One printer circuit breaker 34RB which supplies ACARS printer with 115V.

E. One ACARS pushbutton switch, 15RB, which comes on when a message is received on the aircraft.

4. Component Description

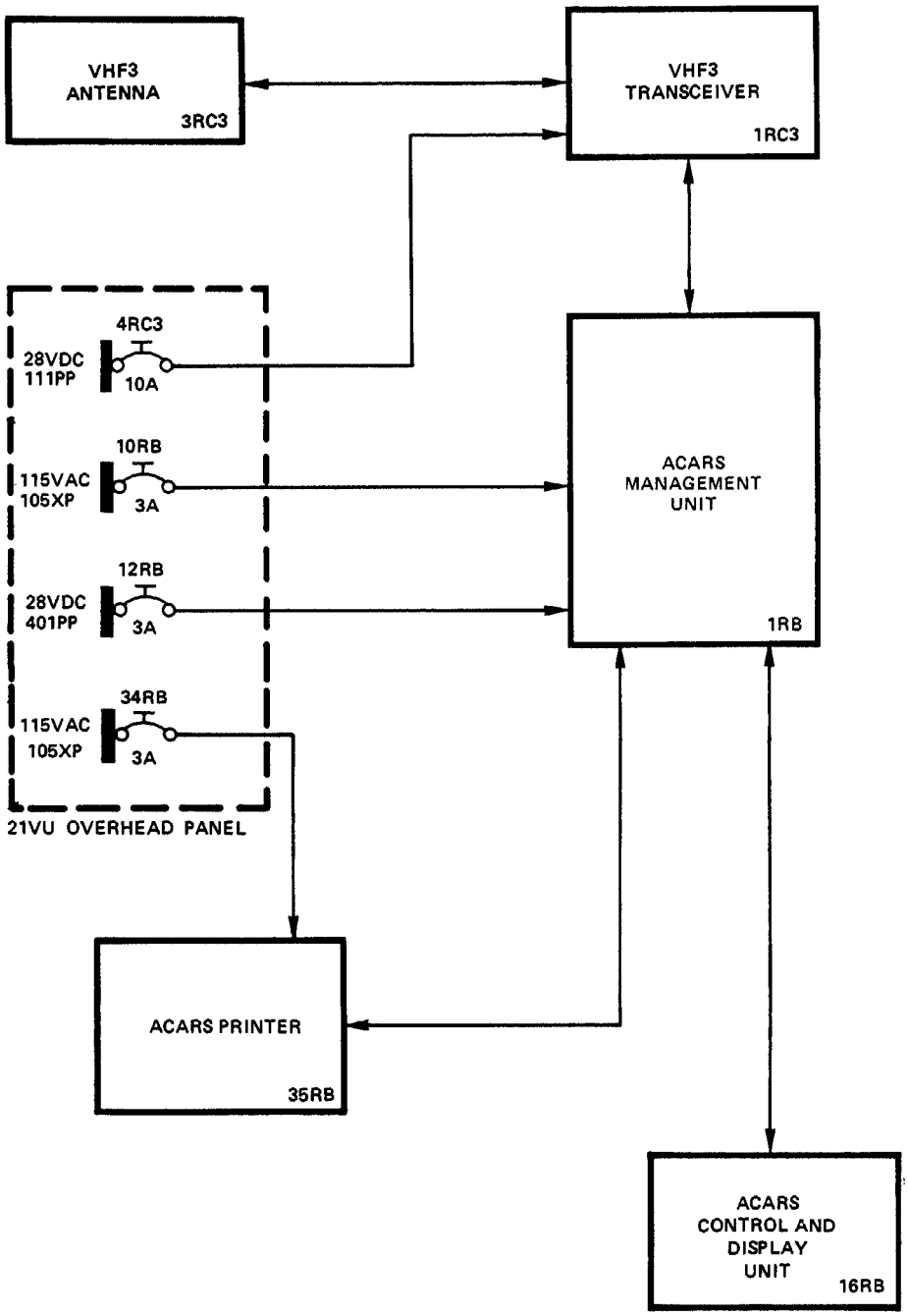
A. VHF3 Transceiver
Ref. 23-12-00, P. Block 1.

B. ACARS Control and Display Unit
(1)Description




BM5 23 24 00 0 BJD0 .00

ARINC Communication Addressing and Reporting System
Component Location
Figure 001




8M5 23 24 00 0 DAF0 00

ACARS - Block Diagram
Figure 002

(Ref. Fig. 003)

(a)Physical characteristics

The face carries :

- two rows of 24 infrared LED/phototransistor (detector)
- two columns of 22 in frared LED/phototransistor (detector)

There are no hard keys on the IDU : menus and keyboards are drawn on the display. Keys are activated by touching them on the display. All connections to the aircraft electrical network are made through one electrical connector on the back of the control display unit.

(b)Electrical characteristics

Power supply : 16VDC (from the management unit).

(2)Operation

(a)Basic IDU operation

When the IDU is initially powered up, it establishes contact with each LRU connected to it. It then establishes a System Menu which contains one line for each of those systems. Then it turns itself over to the number one system (in this case the ACARS MU). The MU then displays its own main menu. When the MAIN key is selected from the ACARS MAIN MENU, the IDU displays the established system menu, allowing the user to select another system, such as the DFDAU.

When a key is touched on the IDU, the key will highlight in reverse video. Moving the finger to another key without breaking contact with the screen will return the first key touched back to normal video and will then highlight the new key being touched. Releasing the key when it is highlighted activates the key.

(b)Special keys

There are several keys found on various pages which always perform the same functions. These special keys are described in the following sections.

1 MAIN key

Touching the MAIN key provided on the ACARS MAIN MENU returns the display back to the ACDU/IDU Main System Menu.

2 MENU key

Touching the MENU key returns the display back to the last active menu page.

3 Return (RTN) key

Touching the RTN key returns the display back to the page that was active when the current page was called up.

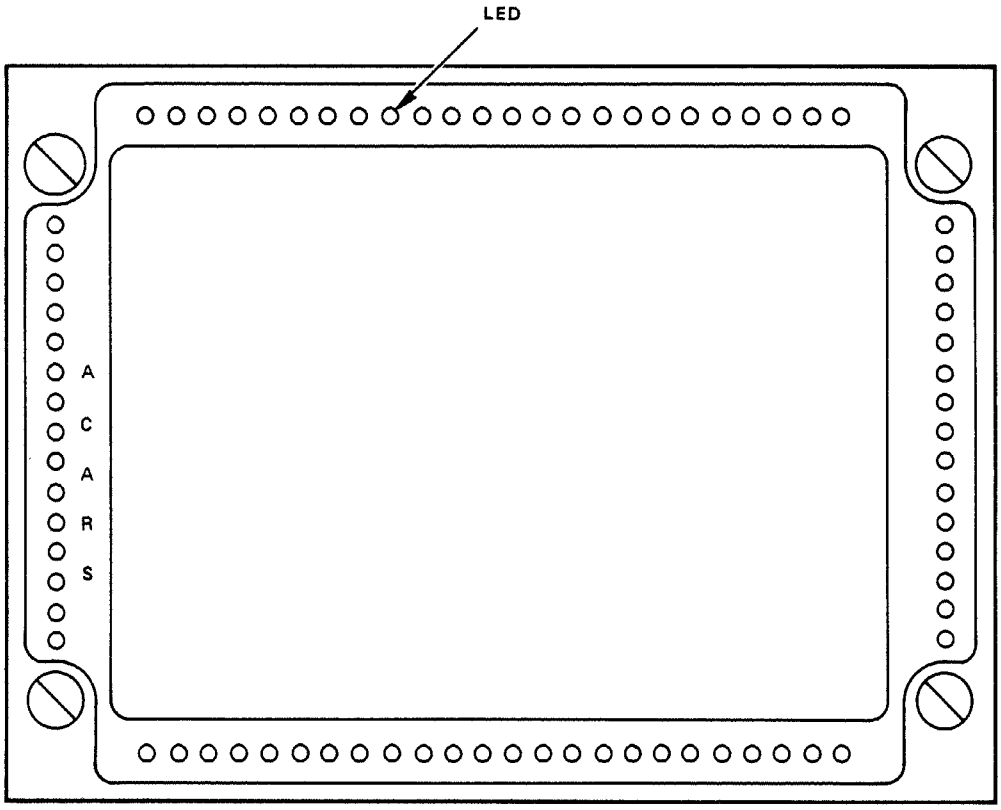
4 Enter (ENT) key

Touching the ENT key stores all the displayed contents of an underlined field and move the underline (with cursor) to the next field. If the field is the last on the page, then touching ENT displays the next page of a multi-page entry format, or displays the summary/SEND page if the last entry of a message. Other special functions of the ENT key are described with particular display operation descriptions.

5 Clear (CLR) key

Touching the CLR key blanks the underlined characters of a field at at the cursor position and to its right only. The cursor remains in the same position.

6 SEND key




INTERACTIVE DISPLAY UNIT

BMb 23 24 00 0 AUMU -42

ACARS Interactive Display Unit
Figure 003

Touching the **SEND** key on some function pages queues the indicated message for downlight transmission and returns to the menu from which the page was called.

7 **RE-DO** key

Touching the **RE-DO** key provided on data summary pages returns back to the first data entry page for the summarized data to allow changes to the entered data.

8 **VOX** key

Touching the **VOX** key calls up the **VOICE MODE** page and places the **MU** in the **VOICE MODE.**

9 Printer **(PRT)** key

If a cockpit printer is installed, touching the **PRT** key sends the displayed message or report to the printer and leaves the display on the current page.

(c)Advisories

The second key from the left at the bottom of each display is reserved for the advisory key. It is represented by "****" on the display format definitions within this document.

On any given page the advisory is always the current highest priority advisory or blank. Advisories can be displayed in either normal video, inverse video, or flashing from normal to inverse video at the rate of 500 ms each state. They are represented here as **XXXX**, **(XXXX)**, and **!XXXX!** for normal, inverse, or flashing, respectively. The criteria for displaying each advisory and any action to be taken upon touching the advisory key is described here in decreasing order of priority with highest priority first.

1 **!FAIL!**

**A** new failure has been detected in the **MU,** or has been reported to the **MU,** and has not yet been displayed on the **ACARS STATUS** page. Activation displays the **ACARS STATUS** page and cancels the advisory.

2 **!DATA!**

**A** downlink message is in queue but the system is in voice mode. Activation causes **MU** to return to data mode and cancels the advisory.

3 **!SELCL!**

An uplink **54** message has been received but the **CALL COMPANY** page has not been called to the display. Activation calls the **CALL COMPANY** page to the display, deactivates the **VOICE-GO- AHEAD** contacts, and cancels the advisory.

4 **!*MSG*!**

An uplink message has been received but has not been called to the display. Activation calls the oldest message to the display which has not yet teen displayed. The advisory is then cancelled unless another message is still waiting to be displayed.

5 **!INIT!**

**A** data field from the **FLIGHT INITIALIZATION** page has not been entered since the start of flight event and the **FLT INIT** page is not on display. Activation calls the **FLT INIT** page to the display and cancels the advisory.

6 **SEND**

**A** message has been sent and is waiting for acknowledgement. No response when activated.

7 **NOCOM**
A message has been sent the required number of times and no acknowledgement was received.

8 **(FAIL)**
A failure that has been previously displayed on the **ACARS STATUS** page is still in a failed state. Activation displays the **ACARS STATUS** page.

9 **VOICE**
The system is in **VOICE** made but has no messages to send. Activation calls up the **VOICE MODE** page.

(d)**MENU** pages
Each menu consists of lines that can be selected to call up function pages or other menus.
The entire line of each item on the menu acts as a key.

1 **ACARS MAIN MENU**
When the **ACARS MU** is given control of the **IDU,** the **MU** displays the **ACARS MAIN MENU.**
The **ACARS MAIN MENU** is the root page through which all other **ACARS** pages may be accessed.

2 **PRE-FLIGHT MENU**
The **PRE FLIGHT** menu can be called up from the **ACARS MAIN MENU.** It is used to call up functions prior to departure.

3 **IN FLIGHT MENU**
The **IN-FLIGHT MENU** can be called up from the **ACARS MAIN MENU.** It is used to call up functions normally used during flight.

4 **MISCELLANEOUS MENU**
The **MISCELLANEOUS MENU** can be called up from the **ACARS MAIN MENU.** It is used to call up some of the less frequently used functions.

5 **MAINTENANCE MENU**
The **MAINTENANCE MENU** can be called up from the **MISCELLANEOUS MENU.** It is used to call up maintenance functions for both the flight crew and maintenance personnel.

(e)Function pages
Function pages are used to display and/or enter data. These are the principal pages.

1 Flight Initialization
The flight initialization page can be called up via the **PRE-FLIGHT MENU** or the **INIT** advisory key.

2 **GROUND DELAY**
The **GROUND DELAY** page is for reporting a delay on the ground prior to takeoff. It can be called up from the **PRE-FLIGHT-MENU,** but only after the **OUT** and before the **OFF** event.

3 **GMT AUTO UPDATE** page
This fonction enables automatic updating of the **GMT.**
It is selected only when the aircraft is parked.

4 **GMT MANUAL UPDATE** page
This procedure enables manual updating of the **GMT** by means of the display keyboard.
The **GMT** can be updated only when the aircraft is parked.

5 **WEATHER REQUEST**
The **WEATHER REQUEST** page can be called up from either the

PRE-FLIGHT MENU or IN-FLIGHT MENU.
It is used to enter data for the weather request message.

6 ATIS REQUEST (Airport Terminal Information Service)
The ATIS REQUEST page can be called up from the MISCELLANEOUS MENU. It is used to enter the departure station before the OFF event and the destination station after the OFF event.

7 IN RANGE REPORT
The IN RANGE REPORT page is called up from the In flight menu. It is used to enter data for the IN RANGE REPORT message. It can only be entered while airborne.

8 REVISED ETA (Estimated time of arrival report)
The REVISED ETA page can be called up from the IN-FLIGHT MENU while airborne only. It is used to revise the previously calculated ETA or re-revise the previously entered ETA.

9 0001 TIMES (OUT-OFF-ON-IN EVENTS) display
The 0001 TIMES can be called up from the ACARS MAIN MENU. The OUT-OFF-ON IN EVENT Times are the GMT times at which the aircraft goes out of the gate, off the ground, back on the ground and back in the gate.

- OUT Event (departure from parking area)
  An OUT event is recorded when the following conditions are met.
  . all doors closed
  . Parking brake released
- OFF event (takeoff)
  An OFF event is recorded when the following condition is met.
  . landing gear retracted for 10 s.
- ON event (landing)
  An ON event is recorded when the following condition is met
  . landing gear extented for 10 s.
- In event (return to parking area)
  An in event is recorded when one of the following conditions is met :
  . One of the doors is open
  . parking brake is on.

10 Display illum/test
The display illum/test page can be called up from the MISCELLANEOUS MENU. It allows the crew to set the display intensity and to test the LEDs and the SELCAL.

11 Diversion
It has the same function as the revised ETA page, but it can be called up from the MISCELLANEOUS MENU.

12 ENGINE/PERFORMANCE REPORT
The ENGINE/PERFORMANCE REPORT can be called up from the MISCELLANEOUS MENU. It is used to initiate a request to the DFDAU to generate and send an ENGINE/PERFORMANCE REPORT downlink message.

13 DATA MODE FREQUENCY
The DATA MODE FREQUENCY page is used to identify or select the frequency in use in the data mode. It can be called up from the MAINTENANCE MENU. The PRIM FREQ is the data mode Primary Frequency. It is initially set to 131.550 Mhz. The ALTN FREQ is the Alternate or Secondary Frequency.

It is initially set to 131.725 Mhz.

14 PROGRAM/I.D/SENSOR STATUS

The PROGRAM I.D/SENSOR STATUS display page is used to display the Software Program Identification and the status of the discrete sensors for aircraft wiring verification.

15 ACARS STATUS

The ACARS STATUS page is used to display the health of the MU internal hardware, the health of the IDU as observed by the MU or as reported to the MU by the IDU and the condition of the interface to the DFDAU. It can be called up from the MAINTENANCE MENU or the !FAIL! advisory key.

16 PRINTER TEST

The PRINTER TEST Page is for testing the cockpit printer. It can be called up from the MAINTENANCE MENU.

17 VOICE MODE

Voice mode can be entered either by selecting VOICE MODE on the CALL COMPANY page or the VOX key on menu pages. During VOICE MODE no messages can be received or transmitted via the VHF transceiver.

C. ACARS Management Unit

(1)Description

(Ref. Fig. 004)

(a)Physical characteristics :

The face carries :

- one M/U FAIL indicator light which comes on when the MU built-in self test diagostic program during link test detects a failure of the MU internal functions.
- one C/U FAIL indicator light which comes on when the CU built-in self test diagnostic program during link test detects a failure of the CU internal functions.

All connections to the aircraft electrical network are made through two connectors on the back of the management unit.

(b)Electrical characteristics :

power supply : 115VAC, 400 HZ, 28VDC

(2)Operation

The management unit gathers data for transmission to ground from the Interactive Display Unit and event sensors mounted within the various aircraft systems. It acts as the interface between the airborne equipment and the ground. The MU performs as a monitoring device for the event sensors, IDU for ACARS, performs error checks of messages and supplies operating power for the IDU and MU circuits.

D. ACARS Printer

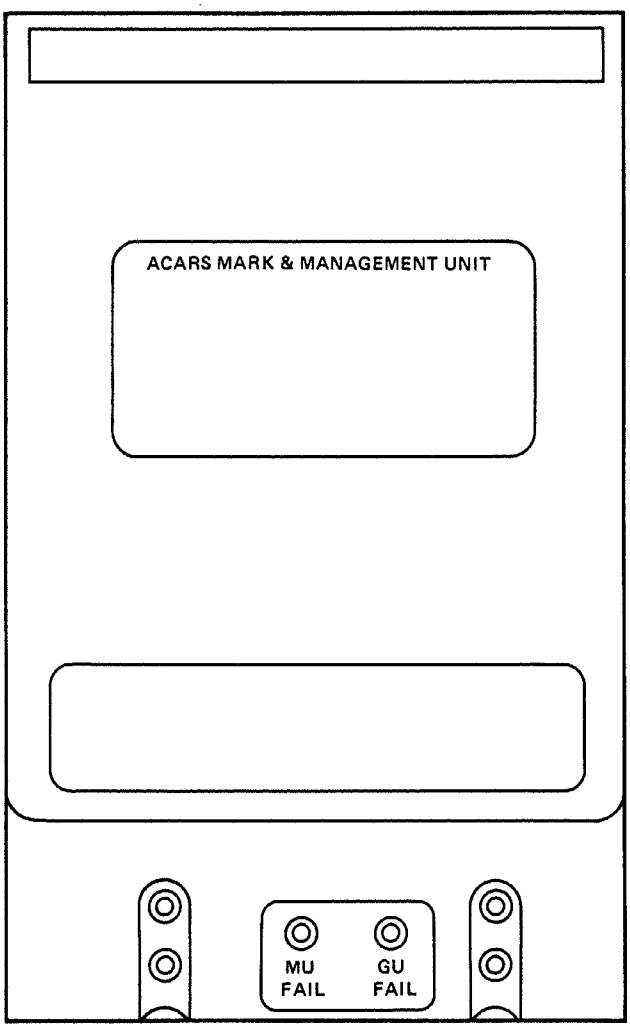
(1)Description

(Ref. Fig. 005)

(a)Physical characteristics

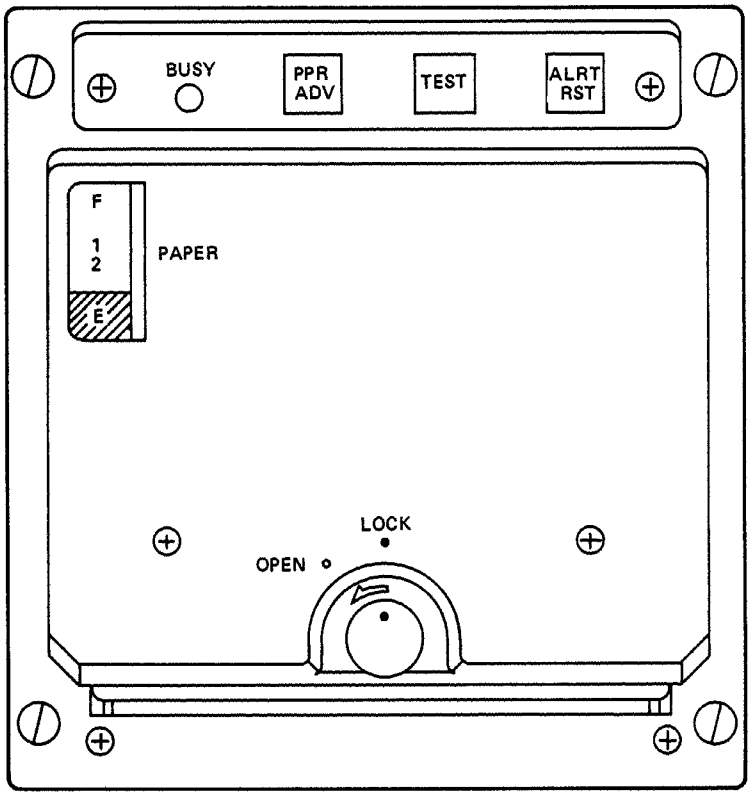
For indication and manual operation, one indicator light and three pushbutton switches are located on the front panel of the printer :

- Pressing the PPR ADV pushbutton switch allows manual control of line feed of the paper.
- Pressing the TEST pushbutton switch causes a test pattern of the full character complement to be printed.
- The BUSY lamp indicates the receipt of data message.




BM5 23 24 00 0 AEMO 22

ACARS Management Unit
Figure 004




BM5 23 24 00 0 BEM0 23

ACARS Printer
Figure 005

- The ALRT-RST (alert - reset) pushbutton switch resets the printer aural/visual alert function.
- One window permits a visual control of the paper quantity.

(b)Electrical characteristics

power supply : 115VAC

R 1. General

This maintenance practice provides procedure after a change of Aircraft Registration Number.

2. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| Referenced Procedure<br>- AWM 23-24-07 | Communications ACARS Program Identification |

3. Procedure to Use Aircraft Coding Plug

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO-NAV & COM-MANAGEMENT UNIT/115VAC | 10RB | 107/C 9 |
| 21VU | RADIO-NAV & COM-MANAGEMENT UNIT/28VAC | 12RB | 107/C 8 |

(2)Open access door 121BL to gain access to avionics compartment.

(3)Gain access to the ACARS Management Unit.

B. Procedure

(Ref. Fig. 201)

NOTE : The following connections are given as examples for the coding plug 2055VC-A (Ref. AWM 23-24-07).

(1)If necessary, remove the existing connections from the coding plug.

(2)Connect the Airline Identification : (e.g. AI)

- connect following pin's : G/P/R/S/T/U (A) & G/H/J/L/M (I).

(3)Connect the A/C Tail Number (e.g. D-ABCD) :

NOTE : The first digit is always a dot (.).

NOTE : Only upper case letters, digits, dots, commas, dashes, spaces and parentheses are accepted.

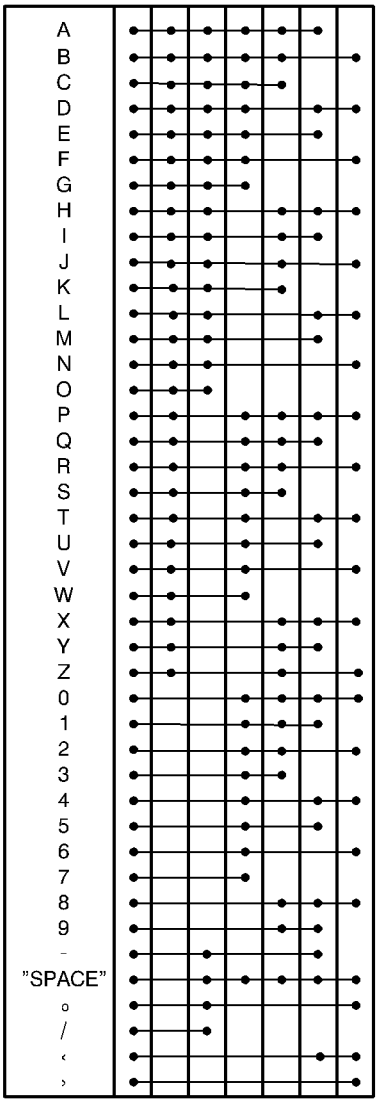
NOTE : Any pin to be coded zero (O) must be connected to the common pin (G).

- connect following Pin's for CH1# : G/KK/PP (.),
- connect following Pin's for CH2# : G/CC/DD/EE/GG/HH (D),
- connect following Pin's for CH3# : G/-X/AA (-),
- connect following Pin's for CH4# : G/-Q/-R/-S/-T/-U (A),
- connect following Pin's for CH5# : G/-I/-J/-K/-M/-P (B),
- connect following Pin's for CH6# : G/-C/-D/-E/-F (C),
- connect following Pin's for CH7# : G/W/X/Y/-A/-B (D).

(4)Install the coding plug 2055VC-A on the panel 90VU.

| | AIRLINE IDENT | | | | | | |
|---|---|---|---|---|---|---|---|
| CH1# | G | P | R | S | T | U | V |
| CH1# | | H | J | K | L | M | N |

| | A/C TAIL NUMBER | | | | | | |
|---|---|---|---|---|---|---|---|
| CH1# | G | JJ | KK | LL | MM | NN | PP |
| CH2# | g | CC | DD | EE | FF | GG | HH |
| CH3# | r | -W | -X | -Y | -Z | AA | BB |
| CH4# | o | -Q | -R | -S | -T | -U | -V |
| CH5# | u | -I | -J | -K | -M | -N | -P |
| CH6# | n | -C | -D | -E | -F | -G | -H |
| CH7# | d | W | X | Y | Z | -A | -B |




BM5 23 24 00 2 AAP0 00

Coding Table of the Coding Plug 2055VC-A
Figure 201

(5)Close circuit breakers.

C. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close access door 121BL.

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RAD NAV & COM-MANAGEMENT UNIT/115VAC | 10RB | 107/C9 |
| 21VU | RAD NAV & COM-MANAGEMENT UNIT/28VDC | 12RB | 107/C8 |
| 21VU | RAD NAV & COM-MANAGEMENT UNIT/28VDC | 4RC3 | 106/D8 |
| 21VU | ACARS/AIDS PRINTER | 34RB | 105/E1 |

(1)Close circuit breakers 10RB, 12RB, 4RC3 and 34RB.
(2)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(3)Restore system and aircraft to normal operating condition.

## 1. General

R **ON A/C 101-200,

A. The Passenger Address and Entertainment System is a collective title used to describe the following separate sub-systems:
- Passenger Address System (23-31-00)
- Announcement/Music Tape Reproducer System (23-32-00)
- Passenger Entertainment (Music) (23-33-00)
- Passenger Service System (23-38-00)

R **ON A/C 001-100,

A. The passenger Address and Entertainment System is a collective title used to describe the following separate sub-systems:
- Passenger Address System (23-31-00)
- Announcement/Music Tape Reproducer System (23-32-00)
- Passenger Entertainment System (Music) (23-33-00)
- Passenger Entertainment System (Video) (23-36-00)
- Airshow System (23-37-00)

R **ON A/C 101-200,

## R 2. Description

R A. Passenger Address System
R The passenger address system provides the means for verbal communication
R from the flight compartment and cabin attendant stations to passengers.
R The system is also used to generate and broadcast chimes which accompany
R flight crew, cabin attendant and passenger calls. Chimes are also gener-
R ated during the operation of 'FASTEN SEAT BELT' and 'NO SMOKING' announ-
R ciator signs. The PA system also provides the possibility to amplify
R and broadcast signals from the entertainment systems.

R B. Announcement/Music Tape Reproducer (T/R) System
R The T/R system uses a tape reproducer to enable prerecorded announcements
R and music, stored on magnetic tape cassettes, to be broadcast via the PA
R system and passenger entertainment systems.

R C. Passenger Entertainment System (PES) - Music
R The PES music system is a system which provides prerecorded audio
R entertainment and boarding music for the passengers. A tape reproducer
R is used to provide several entertainment programs stored on magnetic tape
R cassettes or CDs. These programs can be individually selected from
R passenger control units installed in the seat armrests.

R D. Passenger Service System (PSS)
R The PSS is an installation which provides for the remote switching of
R overhead reading and call lights at each passenger seat. The PSS may be
R installed as either an integral part or separate to any PES (music)
R system.

R **ON A/C 001-100,

2. Description

A. Passenger Address System
The passenger address system provides the means for verbal communication from the flight compartment and cabin attendant stations to passengers. The system is also used to generate and broadcast chimes which accompany flight crew, cabin attendant and passenger calls. Chimes are also generated during the operation of 'FASTEN SEAT BELT' and 'NO SMOKING' annunciator signs. The PA system also provides the possibility to amplify and broadcast signals from the entertainment systems.

B. Announcement/Music Tape Reproducer (T/R) System
The T/R system uses a tape reproducer to enable prerecorded announcements and music, stored on magnetic tape cassettes, to be broadcast via the PA system and passenger entertainment systems.

C. Passenger Entertainment System (PES) - Music
The PES music system is a system which provides prerecorded audio entertainment and boarding music for the passengers. A tape reproducer is used to provide several entertainment programs stored on magnetic tape cassettes or CDs. These programs can be individually selected from passenger control units installed in the seat armrests.

D. Passenger Entertainment System - Video
The PES (Video) is an installation which allows for the transmission of movies etc. via video screens or video monitors located in the passenger compartment. Video sound track can be routed to either the PES (Music) system or to the PA system.

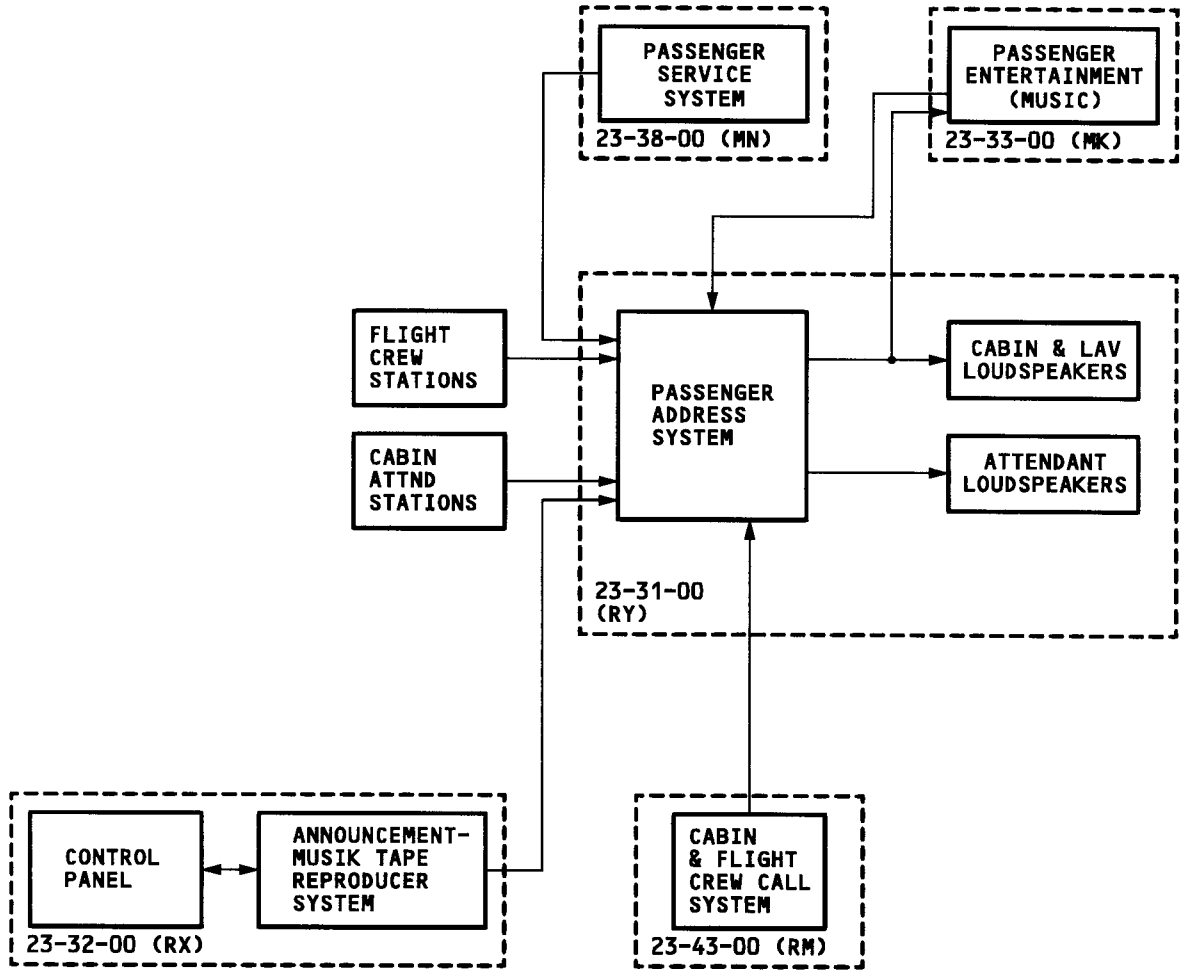
E. Air Show System
The air show system is installed to provide in-flight visual information to the passengers via the video system. The visual information of navigation and air data are displayed on monitor screens.

R **ON A/C 101-200,

(Ref. Fig. 001)

R **ON A/C 001-100,

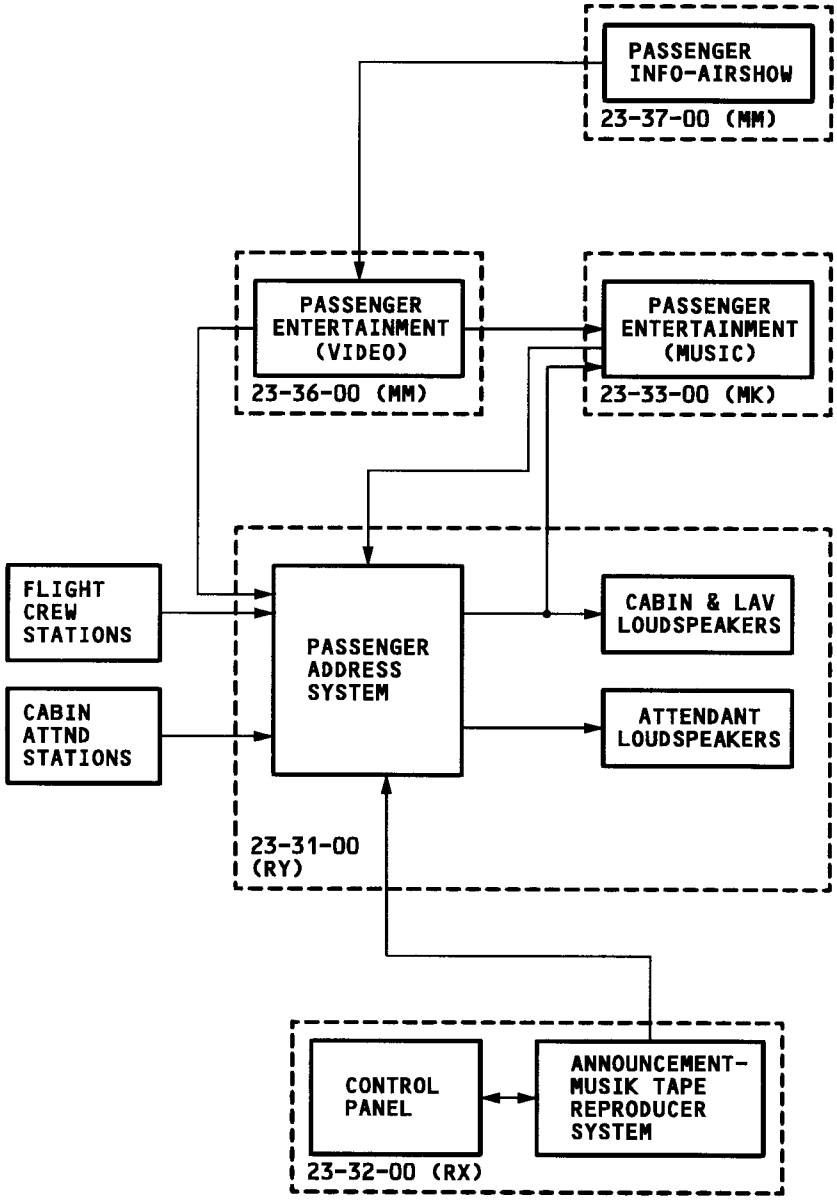
(Ref. Fig. 002)




BM6 23 30 00 0 AAB0 02

Passenger Address and Entertainment System
Block Diagram
Figure 001

R




BM6 23 30 00 0 AAU0 01

Passenger Address and Entertainment System
Block Diagram
Figure 002

# PASSENGER ADDRESS SYSTEM - DESCRIPTION AND OPERATION

## 1. General

The passenger address system provides the means for verbal communication from the flight crew compartment and cabin attendant stations to aircraft passengers. The system is also used to generate and broadcast chimes which accompany flight crew, cabin attendant and passenger calls. Chimes are also generated during the operation of **'FASTEN SEAT BELT'** and **'NO SMOKING'** annunciator signs. The system also provides the possibility to amplify the passenger entertainment system.

## 2. Component Location

**ON A/C 001-100,

(Ref. Fig. 001)

**ON A/C 101-200,

(Ref. Fig. 002)

**ON A/C ALL

(Ref. Fig. 003)

**ON A/C 001-100,

(Ref. Fig. 004)

**ON A/C 101-200,

(Ref. Fig. 005)

**ON A/C ALL

(Ref. Fig. 006)

**ON A/C 001-100,

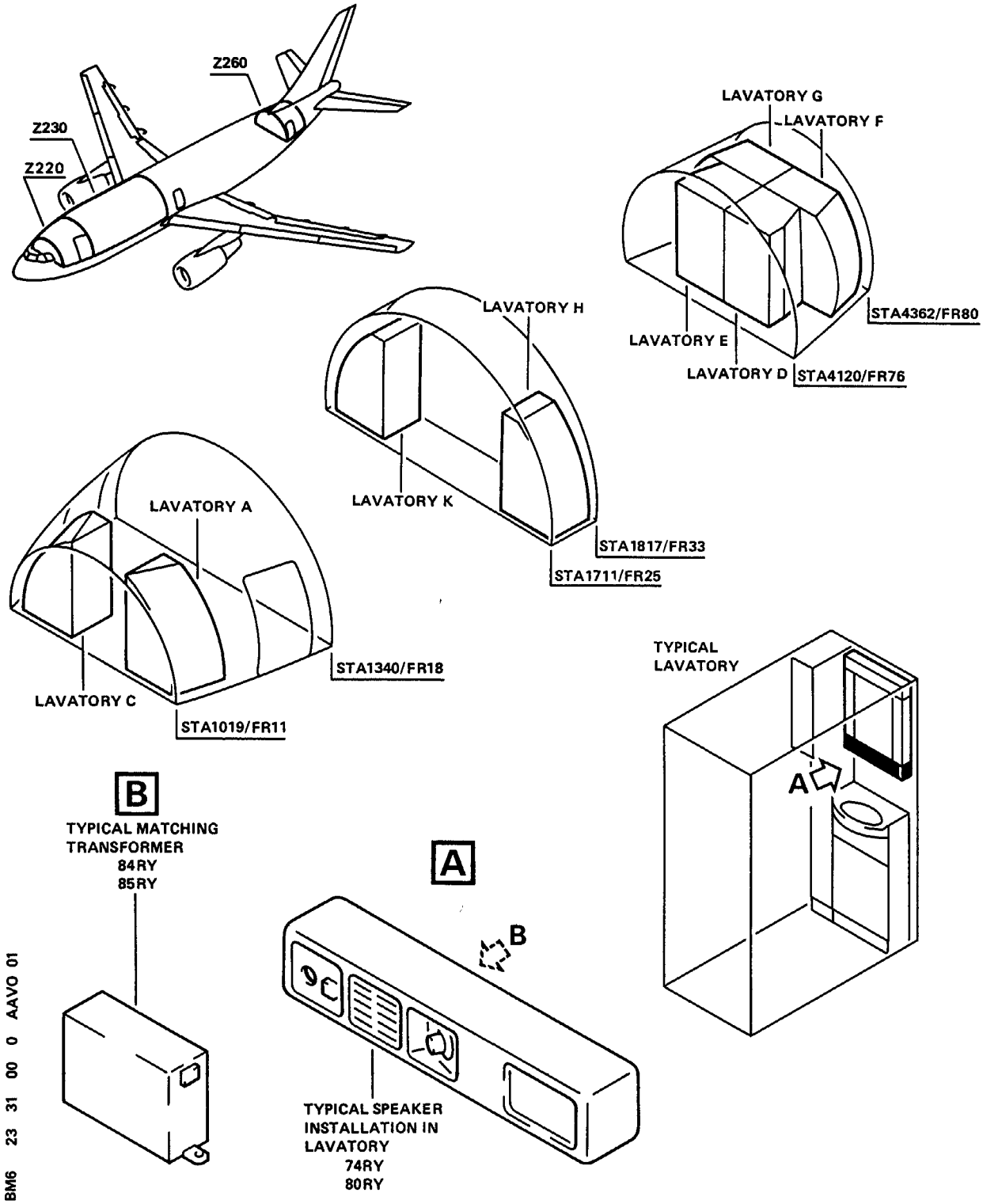
(Ref. Fig. 007)

**ON A/C 101-200,

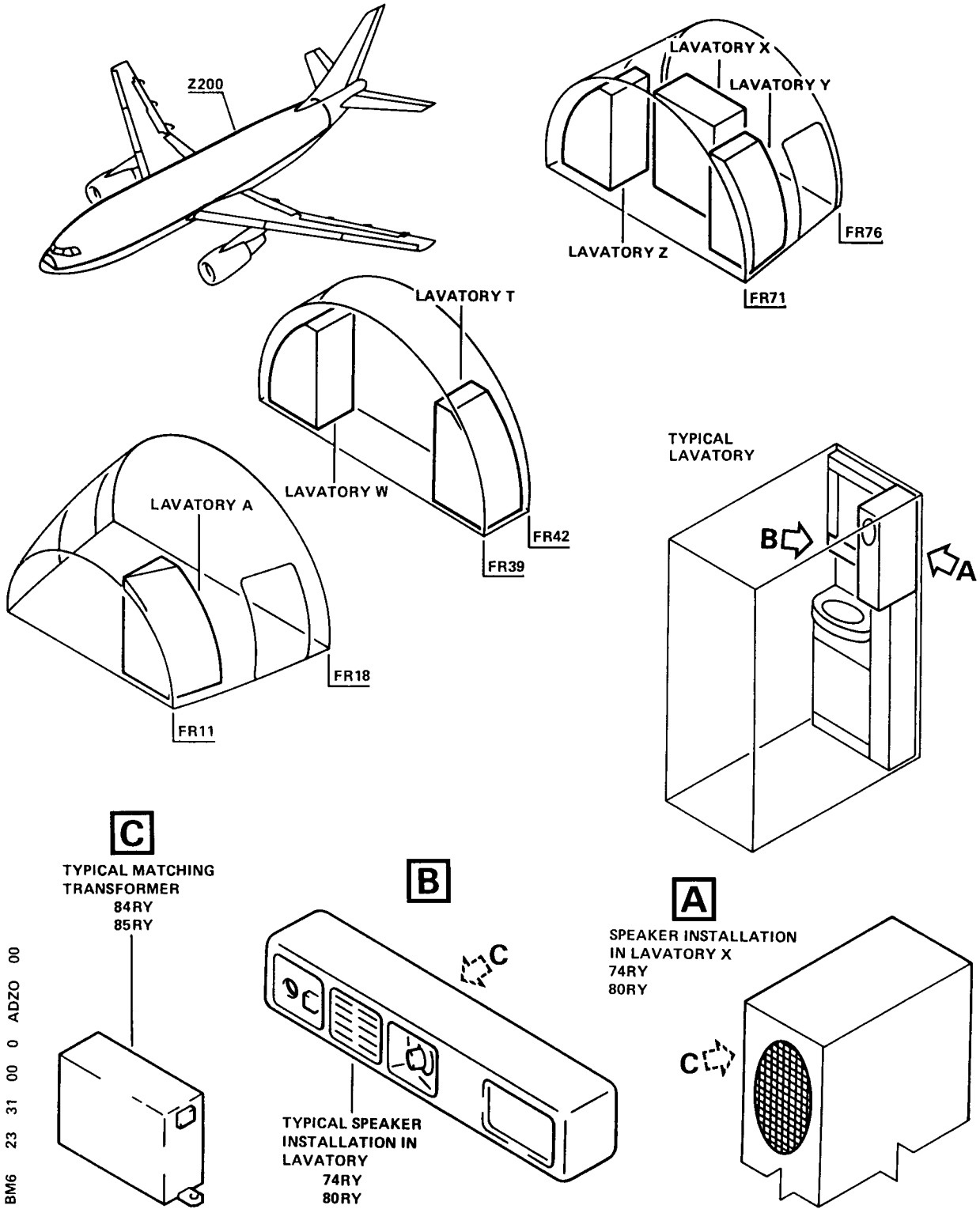
(Ref. Fig. 008)

R **ON A/C 101-104,

R Post SB 23-2082 For A/C 101-104,




Speaker Lavatories
Figure 001



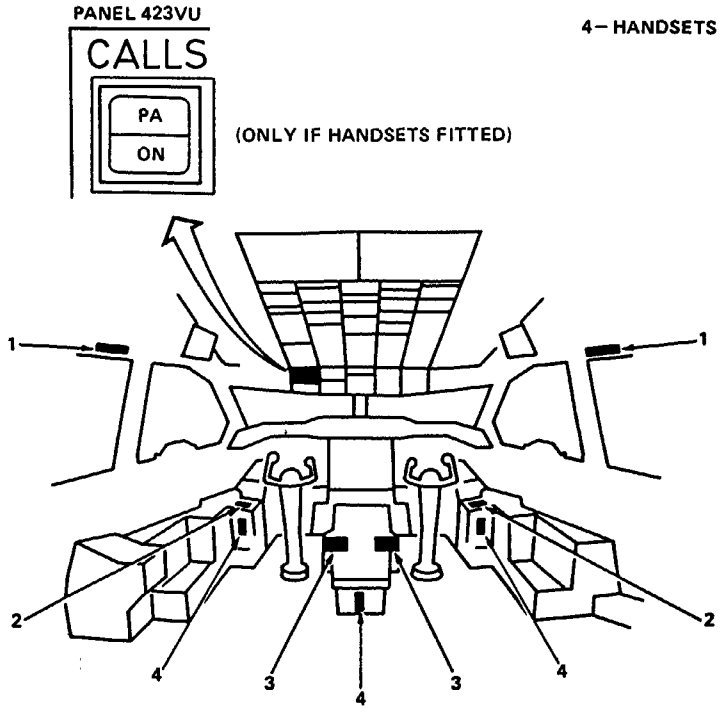

Speaker Lavatories
Figure 002

1– JACK PANEL–BOOM SETS

2– MASK MICROPHONES

3–AUDIO CONTROL PANELS

4– HANDSETS (IF FITTED)

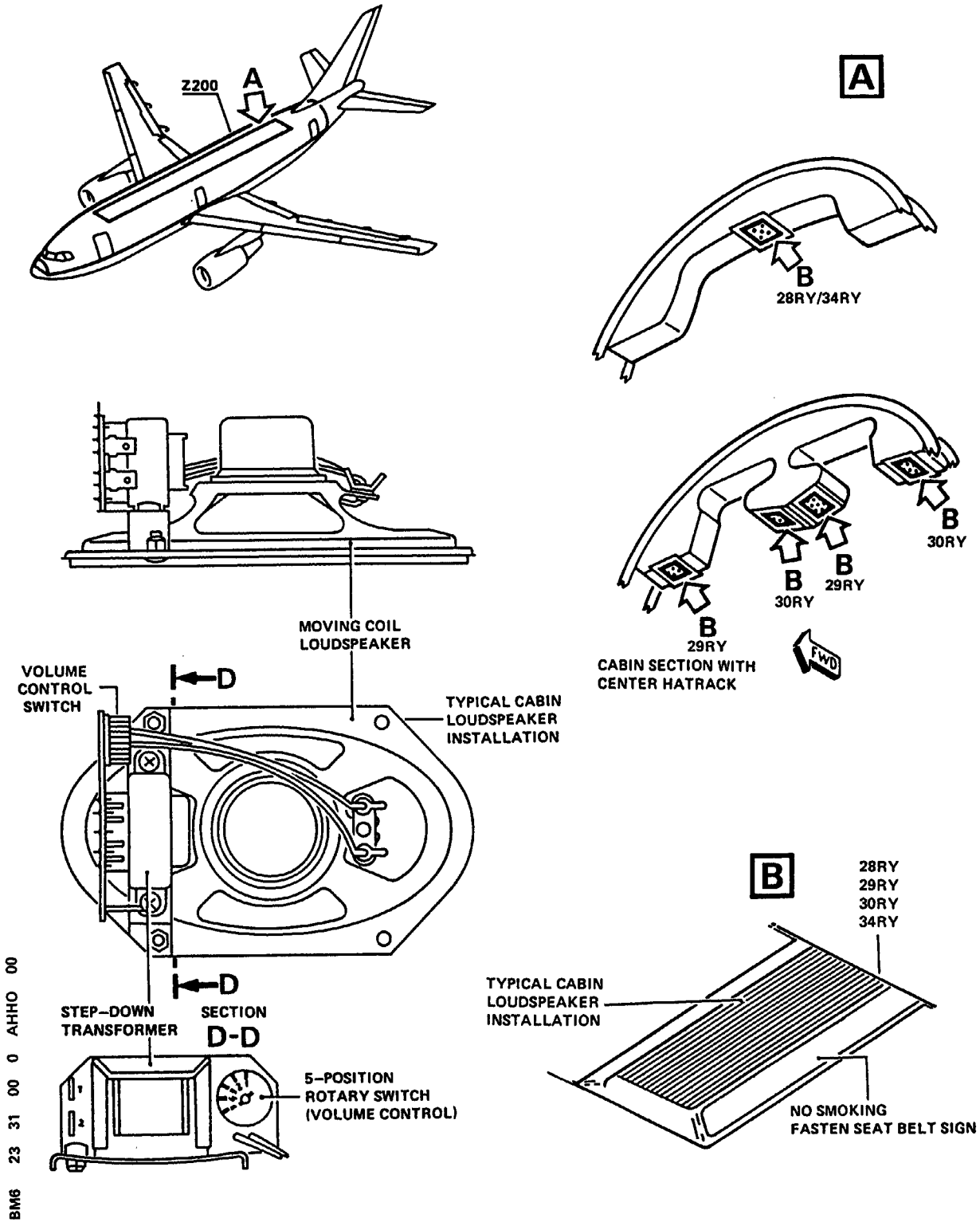



BM6 23 31 00 0 AGAO 01

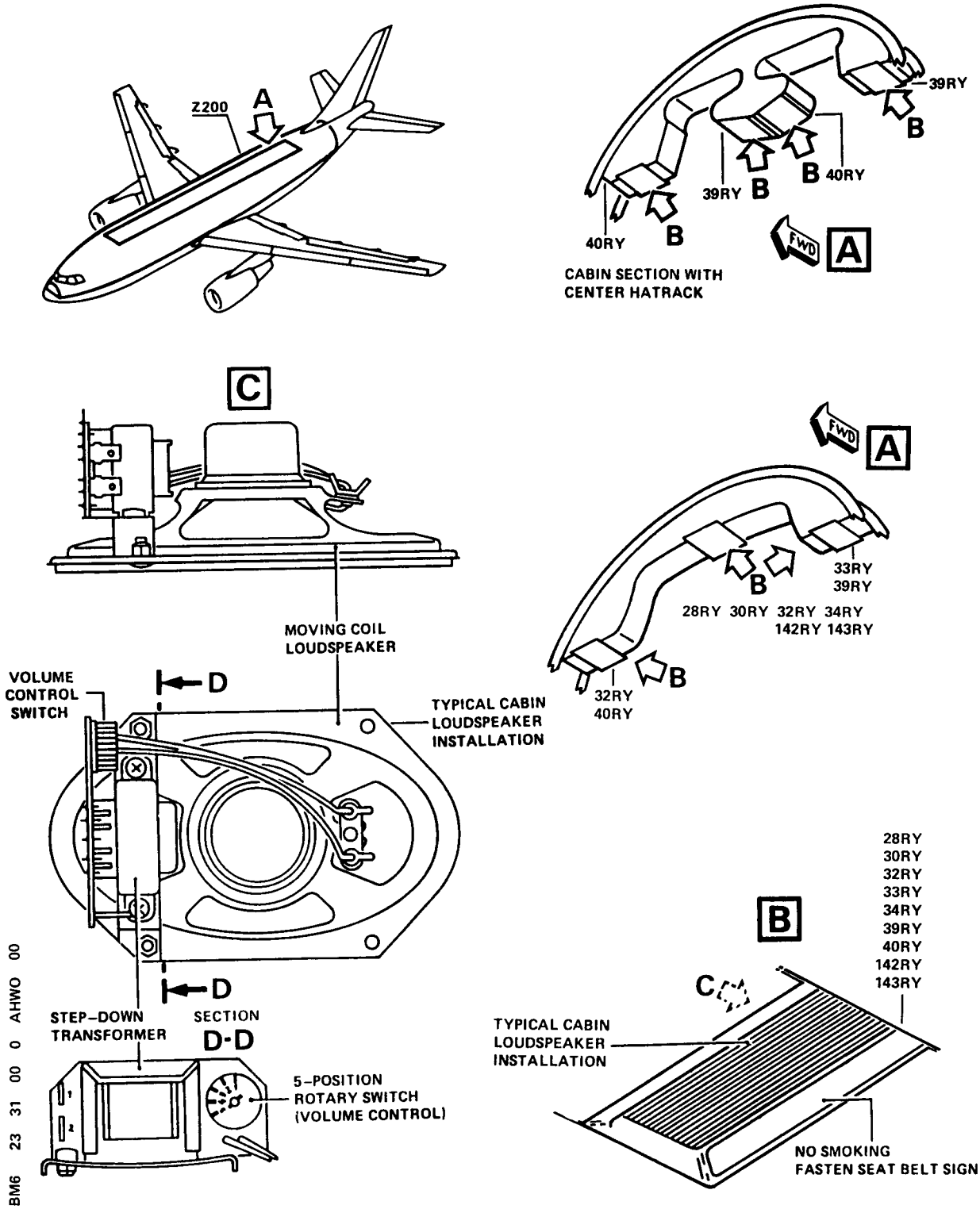
Location in Cockpit
Figure 003



Printed in France

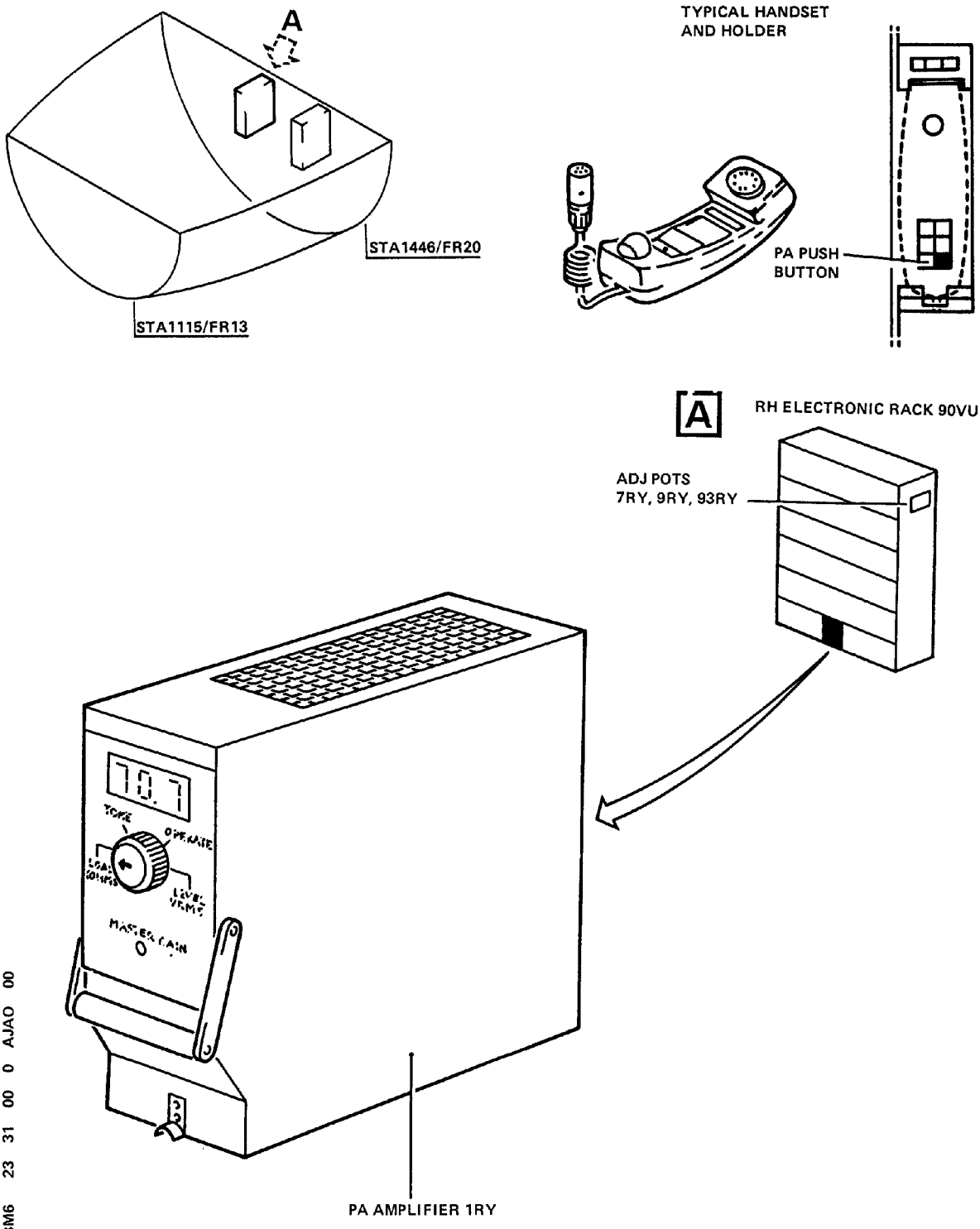



Location Cabin Speaker
Figure 004

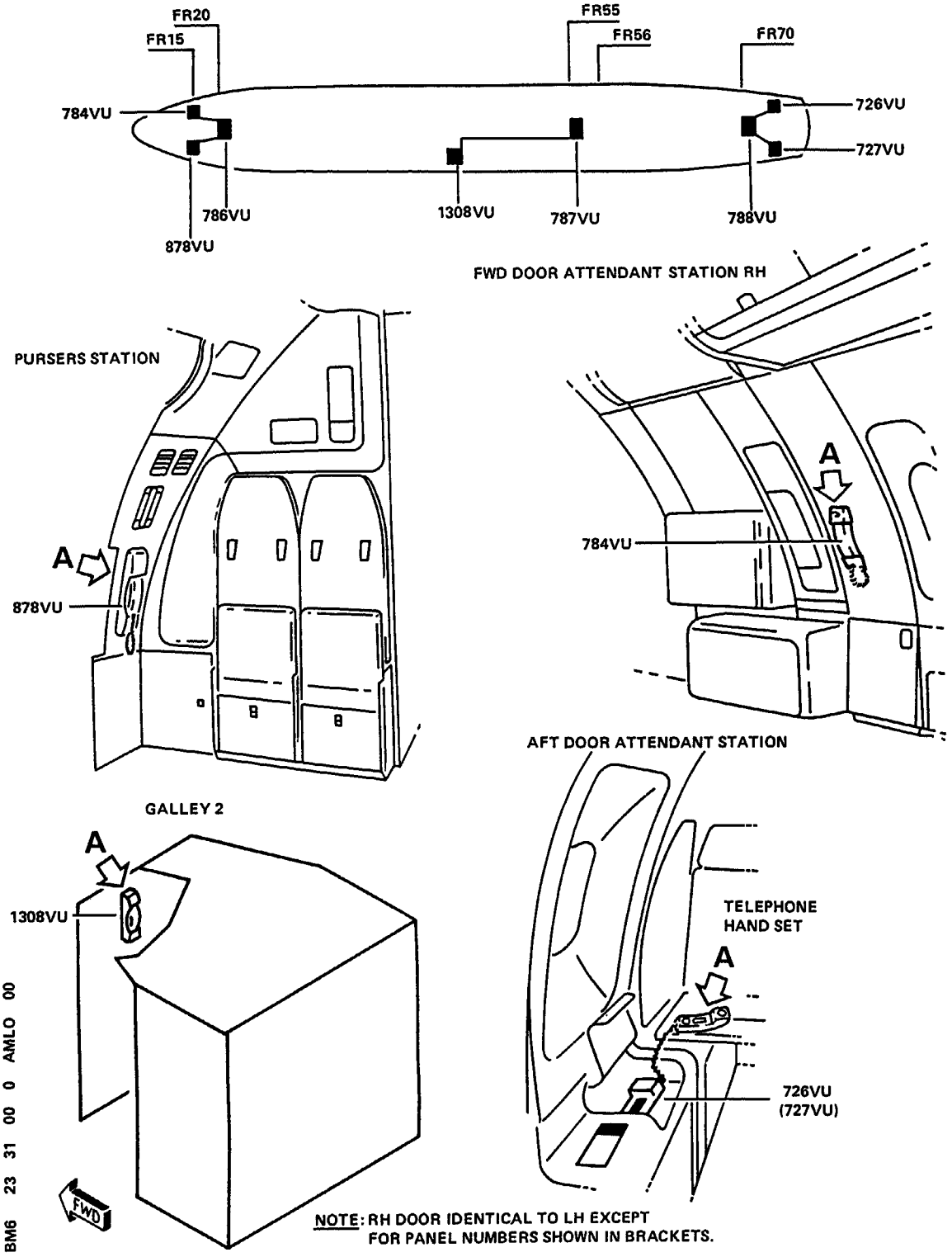



Location Cabin Speaker
Figure 005

R

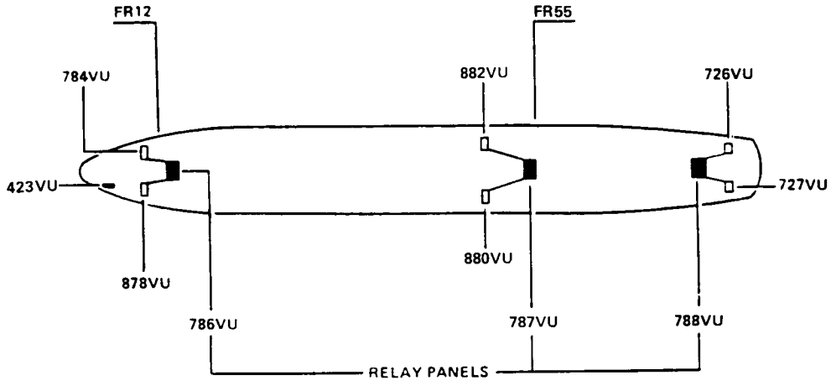



Location PA-Amplifier
Figure 006

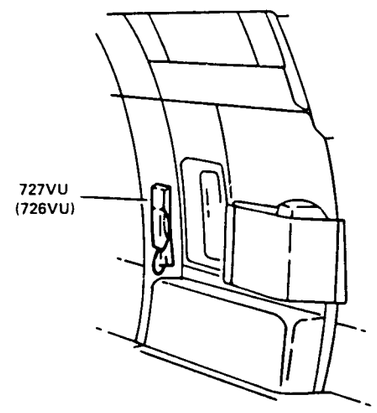



BM6 23 31 00 0 AMLO 00

Purser/Attendant Station in Passenger Compartment
Figure 007

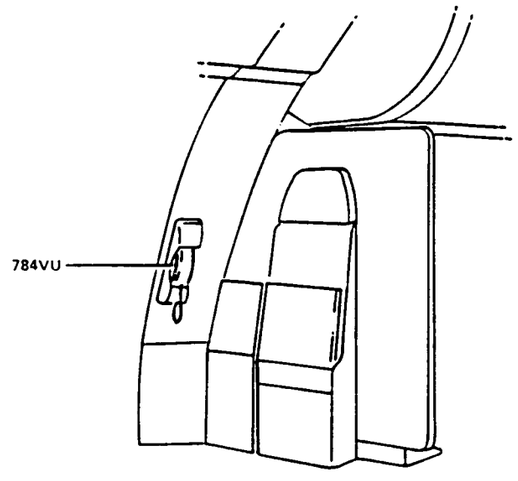



AFT DOOR

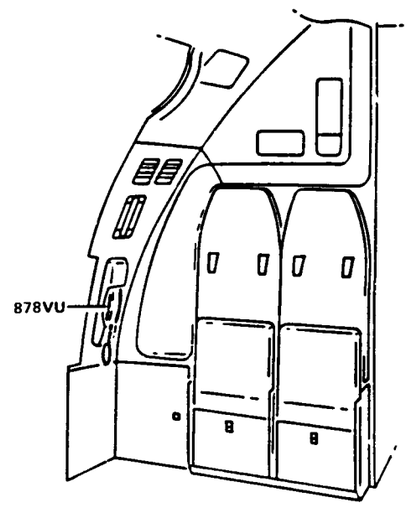


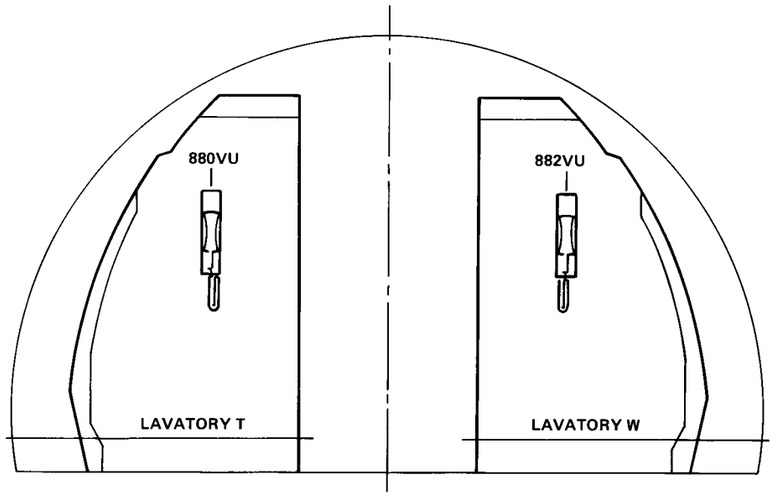

NOTE: RH DOOR IDENTICAL TO LH EXCEPT FOR PANEL NUMBERS SHOWN IN BRACKETS

FWD DOOR RH




PURSER




Purser/Attendant Station in Passenger Compartment
Figure 008

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 1RY | AMPLIFIER - PASSENGER ADDRESS | 96VU | 122 | 121BL | |
| 7RY | POTENTIOMETER GAIN CONTROL | 97VU | 122 | 121BL | |
| 9RY | POTENTIOMETER SENSITIVITY CONTROL | 97VU | 122 | 121BL | |
| 12RY | RELAY | 90VU | 122 | 121BL | |
| 28RY | SPEAKER - ATTENDANT | 742VU | 200 | | |
| 30RY | SPEAKER - CABIN | 855VU | 200 | | |
| 32RY | SPEAKER - ATTENDANT | 897VU | 200 | | |
| 33RY | SPEAKER - ATTENDANT | 892VU | 200 | | |
| 34RY | SPEAKER - ATTENDANT | 742VU | 200 | | |
| 39RY | SPEAKER - CABIN | 1355VU | 200 | | |
| 40RY | SPEAKER - CABIN | 1354VU | 200 | | |
| 74RY | SPEAKER LAVATORY 'A' | 817VU | 200 | | |
| 74RY | SPEAKER LAVATORY 'T' | 817VU | 200 | | |
| 74RY | SPEAKER LAVATORY 'X' | | 200 | | |
| 74RY | SPEAKER LAVATORY 'Y' | 817VU | 200 | | |
| 80RY | SPEAKER LAVATORY 'W' | 816VU | 200 | | |
| 80RY | SPEAKER LAVATORY 'Z' | 816VU | 200 | | |
| 84RY | TRANSFORMER LAVATORY 'A' | 817VU | 200 | | |
| 84RY | TRANSFORMER LAVATORY 'T' | 817VU | 200 | | |
| 84RY | TRANSFORMER LAVATORY 'X' | | 200 | | |
| 84RY | TRANSFORMER LAVATORY 'Y' | 817VU | 200 | | |
| 85RY | TRANSFORMER LAVATORY 'W' | 816VU | 200 | | |
| 85RY | TRANSFORMER LAVATORY 'Z' | 816VU | 200 | | |
| 93RY | POTENTIOMETER SIDE TONE OUTPUT CONTROL | 97VU | 122 | 121BL | |
| 94RY | POTENTIOMETER SIDE TONE OUTPUT CONTROL | 277VU | 122 | | |
| 111RY | RELAY-RECEPTION CUT OFF | 786VU | 224 | | |
| 112RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 786VU | 224 | | |
| 115RY | RELAY-RECEPTION CUT OFF | 788VU | 263 | | |
| 116RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 788VU | 263 | | |
| 142RY | SPEAKER - CABIN | 1342VU | 200 | | |
| 143RY | SPEAKER - ATTENDANT | 1342VU | 200 | | |
| 295RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 788VU | 263 | | |
| 296RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 788VU | 263 | | |
| 306RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 254 | | |
| 308RY | RELAY-RECEPTION CUT OFF | 787VU | 254 | | |
| 310RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 254 | | |
| 316RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 243 | | |
| 320RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 786VU | 224 | | |
| 351RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 254 | | |
| 352RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 788VU | 263 | | |
| 361RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 254 | | |
| 501RY | RELAY | 289VU | 122 | 121BL | |
| 502RY | RELAY | 289VU | 122 | 121BL | |
| 513RY | PUSHBUTTON SWITCH | 423VU | 212 | | |
| 517RY | RELAY | 289VU | 122 | 121BL | |
| 522RY | MICROSWITCH-TELEPHONE HANDSET | 458VU | 211 | | |
| 1005RY | RELAY | 786VU | 224 | | |
| 23RJ | HANDSET-TELEPHONE | 878VU | 221 | | |

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 24RJ | HANDSET-TELEPHONE | 882VU | 252 | | |
| 25RJ | HANDSET-TELEPHONE | 880VU | 251 | | |
| 26RJ | HANDSET-TELEPHONE | 726VU | 262 | | |
| 27RJ | HANDSET-TELEPHONE | 727VU | 261 | | |
| 28RJ | RELAY-RECEPTION CUT OFF | 787VU | 254 | | |
| 29RJ | RELAY-RECEPTION CUT OFF | 788VU | 263 | | |
| 32RJ | RELAY-RECEPTION CUT OFF | 786VU | 224 | | |
| 44RJ | HANDSET-TELEPHONE | 784VU | 222 | | |
| 60RJ | HANDSET-TELEPHONE | 458VU | 212 | | |
| 9RM | PUSHBUTTON-PA | 878VU | 221 | | |
| 13RM | MICROSWITCH-TELEPHONE HANDSET | 878VU | 221 | | |
| 17RM | PUSHBUTTON-PA | 882VU | 252 | | |
| 19RM | MICROSWITCH-TELEPHONE HANDSET | 784VU | 222 | | |
| 20RM | MICROSWITCH-TELEPHONE HANDSET | 882VU | 252 | | |
| 24RM | PUSHBUTTON-PA | 880VU | 241 | | |
| 27RM | MICROSWITCH-TELEPHONE HANDSET | 880VU | 241 | | |
| 31RM | PUSHBUTTON-PA | 726VU | 262 | | |
| 34RM | MICROSWITCH-TELEPHONE HANDSET | 726VU | 262 | | |
| 38RM | PUSHBUTTON-PA | 727VU | 261 | | |
| 41RM | MICROSWITCH-TELEPHONE HANDSET | 727VU | 261 | | |
| 47RM2 | PRINTED CIRCUIT BOARD | 786VU | 224 | | 23-43-11 |
| 47RM3 | PRINTED CIRCUIT BOARD | 788VU | 263 | | 23-43-11 |
| 47RM6 | PRINTED CIRCUIT BOARD | 786VU | 224 | | 23-43-11 |
| 48RM | PRINTED CIRCUIT BOARD | 787VU | 254 | | 23-43-11 |
| 92RM | PUSHBUTTON-PA | 784VU | 222 | | |
| 1RN | JUNCTION BOX AUDIO | | 121 | | |
| 6RN | SELECTOR PANEL AUDIO | | 211 | | |

**ON A/C 001-100,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 1RY | AMPLIFIER - PASSENGER ADDRESS | 96VU | 122 | 121BL | |
| 7RY | POTENTIOMETER GAIN CONTROL | 97VU | 122 | 121BL | |
| 9RY | POTENTIOMETER SENSITIVITY CONTROL | 97VU | 122 | 121BL | |
| 12RY | RELAY | 90VU | 122 | | |
| 28RY | SPEAKER - ATTENDANT | 742VU | 200 | | |
| 29RY | SPEAKER - CABIN | 854VU | 200 | | |
| 30RY | SPEAKER - CABIN | 855VU | 200 | | |
| 34RY | SPEAKER - CABIN | 742VU | 200 | | |
| 74RY | SPEAKER LAVATORY 'A' | 817VU | 200 | | |
| 74RY | SPEAKER LAVATORY 'E' | 817VU | 200 | | |
| 74RY | SPEAKER LAVATORY 'F' | 817VU | 200 | | |
| 74RY | SPEAKER LAVATORY 'H' | 817VU | 200 | | |
| 80RY | SPEAKER LAVATORY 'C' | 816VU | 200 | | |
| 80RY | SPEAKER LAVATORY 'D' | 816VU | 200 | | |

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 80RY | SPEAKER LAVATORY 'G' | 816VU | 200 | | |
| 80RY | SPEAKER LAVATORY 'K' | 816VU | 200 | | |
| 84RY | TRANSFORMER LAVATORY 'A' | 817VU | 200 | | |
| 84RY | TRANSFORMER LAVATORY 'E' | 817VU | 200 | | |
| 84RY | TRANSFORMER LAVATORY 'F' | 817VU | 200 | | |
| 84RY | TRANSFORMER LAVATORY 'H' | 817VU | 200 | | |
| 85RY | TRANSFORMER LAVATORY 'C' | 816VU | 200 | | |
| 85RY | TRANSFORMER LAVATORY 'D' | 816VU | 200 | | |
| 85RY | TRANSFORMER LAVATORY 'G' | 816VU | 200 | | |
| 85RY | TRANSFORMER LAVATORY 'K' | 816VU | 200 | | |
| 93RY | POTENTIOMETER SIDE TONE OUTPUT CONTROL | 97VU | 122 | 121BL | |
| 94RY | POTENTIOMETER SIDE TONE OUTPUT CONTROL | 277VU | 122 | | |
| 111RY | RELAY-RECEPTION CUT OFF | 786VU | 234 | | |
| 112RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 786VU | 234 | | |
| 115RY | RELAY-RECEPTION CUT OFF | 788VU | 263 | | |
| 116RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 788VU | 263 | | |
| 295RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 788VU | 263 | | |
| 296RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 788VU | 263 | | |
| 306RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 243 | | |
| 308RY | RELAY-RECEPTION CUT OFF | 787VU | 243 | | |
| 310RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 243 | | |
| 316RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 243 | | |
| 320RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 786VU | 234 | | |
| 351RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 243 | | |
| 352RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 788VU | 263 | | |
| 361RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 243 | | |
| 501RY | RELAY | 289VU | 122 | 121BL | |
| 502RY | RELAY | 289VU | 122 | 121BL | |
| 513RY | PUSHBUTTON SWITCH | 423VU | 212 | | |
| 517RY | RELAY | 289VU | 122 | 121BL | |
| 522RY | MICROSWITCH-TELEPHONE HANDSET | 458VU | 211 | | |
| 1005RY | RELAY | 786VU | 234 | | |
| 11MK4 | PUSHBUTTON-PA AMP 1 'ON' | 746VU | 221 | | |
| 23RJ | HANDSET-TELEPHONE | 878VU | 221 | | |
| 26RJ | HANDSET-TELEPHONE | 726VU | 262 | | |
| 27RJ | HANDSET-TELEPHONE | 727VU | 261 | | |
| 28RJ | RELAY-RECEPTION CUT OFF | 787VU | 243 | | |
| 29RJ | RELAY-RECEPTION CUT OFF | 788VU | 263 | | |
| 32RJ | RELAY-RECEPTION CUT OFF | 786VU | 234 | | |
| 44RJ | HANDSET-TELEPHONE | 784VU | 222 | | |
| 59RJ | HANDSET-TELEPHONE | 1308VU | 232 | | |
| 60RJ | HANDSET-TELEPHONE | 458VU | | | |
| 9RM | PUSHBUTTON-PA | 878VU | 221 | | |
| 13RM | MICROSWITCH-TELEPHONE HANDSET | 878VU | 221 | | |
| 31RM | PUSHBUTTON-PA | 726VU | 262 | | |
| 34RM | MICROSWITCH-TELEPHONE HANDSET | 726VU | 262 | | |
| 38RM | PUSHBUTTON-PA | 727VU | 261 | | |
| 41RM | MICROSWITCH-TELEPHONE HANDSET | 727VU | 261 | | |

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 47RM2 | PRINTED CIRCUIT BOARD | 786VU | 234 | | 23-43-11 |
| 47RM3 | PRINTED CIRCUIT BOARD | 788VU | 263 | | 23-43-11 |
| 47RM6 | PRINTED CIRCUIT BOARD | 786VU | 234 | | 23-43-11 |
| 48RM | PRINTED CIRCUIT BOARD | 787VU | 243 | | 23-43-11 |
| 92RM | PUSHBUTTON-PA | 784VU | 222 | | |
| 105RM | MICROSWITCH-TELEPHONE HANDSET | 1308VU | 232 | | |
| 106RM | PUSHBUTTON-PA | 1308VU | 232 | | |
| 1RN | JUNCTION BOX AUDIO | | 121 | | |
| 6RN | SELECTOR PANEL AUDIO | | 211 | | |

**ON A/C 101-200,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 1RY | AMPLIFIER - PASSENGER ADDRESS | 96VU | 122 | 121BL | |
| 7RY | POTENTIOMETER GAIN CONTROL | 97VU | 122 | 121BL | |
| 9RY | POTENTIOMETER SENSITIVITY CONTROL | 97VU | 122 | 121BL | |
| 12RY | RELAY | 90VU | 122 | 121BL | |
| 28RY | SPEAKER - ATTENDANT | 742VU | 200 | | |
| 30RY | SPEAKER - CABIN | 855VU | 200 | | |
| 32RY | SPEAKER - ATTENDANT | 897VU | 200 | | |
| 33RY | SPEAKER - ATTENDANT | 892VU | 200 | | |
| 34RY | SPEAKER - ATTENDANT | 742VU | 200 | | |
| 39RY | SPEAKER - CABIN | 1355VU | 200 | | |
| 40RY | SPEAKER - CABIN | 1354VU | 200 | | |
| 74RY | SPEAKER LAVATORY 'A' | 817VU | 200 | | |
| 74RY | SPEAKER LAVATORY 'T' | 817VU | 200 | | |
| 74RY | SPEAKER LAVATORY 'X' | | 200 | | |
| 74RY | SPEAKER LAVATORY 'Y' | 817VU | 200 | | |
| 80RY | SPEAKER LAVATORY 'W' | 816VU | 200 | | |
| 80RY | SPEAKER LAVATORY 'Z' | 816VU | 200 | | |
| 84RY | TRANSFORMER LAVATORY 'A' | 817VU | 200 | | |
| 84RY | TRANSFORMER LAVATORY 'T' | 817VU | 200 | | |
| 84RY | TRANSFORMER LAVATORY 'X' | | 200 | | |
| 84RY | TRANSFORMER LAVATORY 'Y' | 817VU | 200 | | |
| 85RY | TRANSFORMER LAVATORY 'W' | 816VU | 200 | | |
| 85RY | TRANSFORMER LAVATORY 'Z' | 816VU | 200 | | |
| 93RY | POTENTIOMETER SIDE TONE OUTPUT CONTROL | 97VU | 122 | 121BL | |
| 111RY | RELAY-RECEPTION CUT OFF | 786VU | 224 | | |
| 112RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 786VU | 224 | | |
| 115RY | RELAY-RECEPTION CUT OFF | 788VU | 263 | | |
| 116RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 788VU | 263 | | |
| 142RY | SPEAKER - CABIN | 1342VU | 200 | | |
| 143RY | SPEAKER - ATTENDANT | 1342VU | 200 | | |
| 295RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 788VU | 263 | | |
| 296RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 788VU | 263 | | |

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 306RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 254 | | |
| 308RY | RELAY-RECEPTION CUT OFF | 787VU | 254 | | |
| 310RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 254 | | |
| 316RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 243 | | |
| 320RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 786VU | 224 | | |
| 351RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 254 | | |
| 352RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 788VU | 263 | | |
| 361RY | RELAY-PA/SERVICE INTERPHONE CHANGEOVER | 787VU | 254 | | |
| 1005RY | RELAY | 786VU | 224 | | |
| 23RJ | HANDSET-TELEPHONE | 878VU | 221 | | |
| 24RJ | HANDSET-TELEPHONE | 882VU | 252 | | |
| 25RJ | HANDSET-TELEPHONE | 880VU | 251 | | |
| 26RJ | HANDSET-TELEPHONE | 726VU | 262 | | |
| 27RJ | HANDSET-TELEPHONE | 727VU | 261 | | |
| 28RJ | RELAY-RECEPTION CUT OFF | 787VU | 254 | | |
| 29RJ | RELAY-RECEPTION CUT OFF | 788VU | 263 | | |
| 32RJ | RELAY-RECEPTION CUT OFF | 786VU | 224 | | |
| 44RJ | HANDSET-TELEPHONE | 784VU | 222 | | |
| 60RJ | HANDSET-TELEPHONE | 458VU | 212 | | |
| 9RM | PUSHBUTTON-PA | 878VU | 221 | | |
| 13RM | MICROSWITCH-TELEPHONE HANDSET | 878VU | 221 | | |
| 17RM | PUSHBUTTON-PA | 882VU | 252 | | |
| 19RM | MICROSWITCH-TELEPHONE HANDSET | 784VU | 222 | | |
| 20RM | MICROSWITCH-TELEPHONE HANDSET | 882VU | 252 | | |
| 24RM | PUSHBUTTON-PA | 880VU | 241 | | |
| 27RM | MICROSWITCH-TELEPHONE HANDSET | 880VU | 241 | | |
| 31RM | PUSHBUTTON-PA | 726VU | 262 | | |
| 34RM | MICROSWITCH-TELEPHONE HANDSET | 726VU | 262 | | |
| 38RM | PUSHBUTTON-PA | 727VU | 261 | | |
| 41RM | MICROSWITCH-TELEPHONE HANDSET | 727VU | 261 | | |
| 47RM2 | PRINTED CIRCUIT BOARD | 786VU | 224 | | 23-43-11 |
| 47RM3 | PRINTED CIRCUIT BOARD | 788VU | 263 | | 23-43-11 |
| 47RM6 | PRINTED CIRCUIT BOARD | 786VU | 224 | | 23-43-11 |
| 48RM | PRINTED CIRCUIT BOARD | 787VU | 254 | | 23-43-11 |
| 92RM | PUSHBUTTON-PA | 784VU | 222 | | |
| 1RN | JUNCTION BOX AUDIO | | 121 | | |
| 6RN | SELECTOR PANEL AUDIO | | 211 | | |

**ON A/C ALL

3. System Description

A. Principle

The PA-system receives low level voice signals from the flight crew and attendant handsets and prerecorded announcement/music signals from tape

reproducers. The amplified signals are broadcast over the loudspeakers in the cabin, attendant stations and the lavatories. Chimes to announce calls and the instructions 'FASTEN SEAT - BELT' and 'NO SMOKING' are also generated by the system amplifier and broadcast over the attendant-speaker and/or the lavatory-speaker.

B. System Architecture

(1)The passenger address system interfaces with the following systems:

- ES - Oil pressure warning system
- LN - Call system
- MK - Passenger entertainment system - music (PES)
- MM - Passenger entertainment system - video (PES)
- RJ - Telephone handsets and control panels of the cabin and service interphone system
- RK - Cockpit voice recorder
- RM - Cabin and flight crew call system
- RN - Flight crew audio selector panels of the audio integrating system
- RX - Announcement/Music tape reproducer system
- WJ - Passenger lighted signs system
- WR - Passenger oxygen system

**ON A/C 101-200,

(2)The PA-amplifier contains a main and an auxiliary amplifier to drive the cabin, attendant and lavatory loudspeakers in the passenger compartment. The main amplifier drives the cabin and lavatory loudspeakers via audio line transformers. The cabin loudspeaker and matching transformer are evenly distributed throughout the aircraft ensuring maximum sound coverage. The attendant loudspeakers, located at attendant stations and galley areas, are driven directly from the auxiliary amplifier.
Flight crew, cabin attendants, prerecorded announcement/music, PES-video and PES-music signals are fed to separate inputs of the PA-amplifier.
Four chime control lines initiate the high, high-low and low chime annunciations generated internally by the PA-amplifier.
Chimes are triggered by a passenger call, an attendant, if smoke is sensed by lavatory smoke detector, and the switches of the 'FASTEN SEAT BELT' and 'NO SMOKING' signs.
Chime deployment to attendant loudspeakers and/or the cabin and lavatory loudspeakers are achieved by applying jumpers to contact B10 and C10 of the amplifier 1RY interface connector via relay 12RY.
Potentiometers 7RY, 9RY and 93RY provide the means of remotely adjusting the input sensitivity gain and side-tone output levels of the amplifier.

R **ON A/C 001-104,

R Post SB 23-2082 For A/C 101-104,

(2)The PA-amplifier contains a main and an auxiliary amplifier to drive the cabin, attendant and lavatory loudspeakers in the passenger compart-

ment. The main amplifier drives the cabin and lavatory loudspeakers via audio line transformers. The cabin loudspeaker and matching transformer are evenly distributed throughout the aircraft ensuring maximum sound coverage. The attendant loudspeakers, located at attendant stations and galley areas, are driven directly from the auxiliary amplifier.
Flight crew, cabin attendants, prerecorded announcement/music, PES-video and PES-music signals are fed to separate inputs of the PA-amplifier.
Four chime control lines initiate the high, high-low and low chime annunciations generated internally by the PA-amplifier.
Chimes are triggered by a passenger call, an attendant, if smoke is sensed by lavatory smoke detector, and the switches of the 'FASTEN SEAT BELT' and 'NO SMOKING' signs.
Chime deployment to attendant loudspeakers and/or the cabin and lavatory loudspeakers are achieved by applying jumpers to contact B10 and C10 of the amplifier 1RY interface connector via relay 12RY.
Potentiometers 7RY, 9RY, 93RY and 94RY provide the means of remotely adjusting the input sensitivity gain and side-tone output levels of the PA-amplifier.

**ON A/C ALL

(3) The PA-system provides an automatic 6dB amplifier gain increase when an engine is running and a further 3dB in the event of a loss of cabin pressure.

**ON A/C 001-100,

(Ref. Fig. 009)

**ON A/C 101-200,

(Ref. Fig. 010)

R **ON A/C 101-104,

R Post SB 23-2082 For A/C 101-104,

(Ref. Fig. 011)

**ON A/C ALL

C. System Power Supply
The system is supplied with 28 V DC from the essential busbars. Amplifier 1RY, system control relays and associated PC-boards are supplied from busbar 303PP via circuit breaker 5RY.

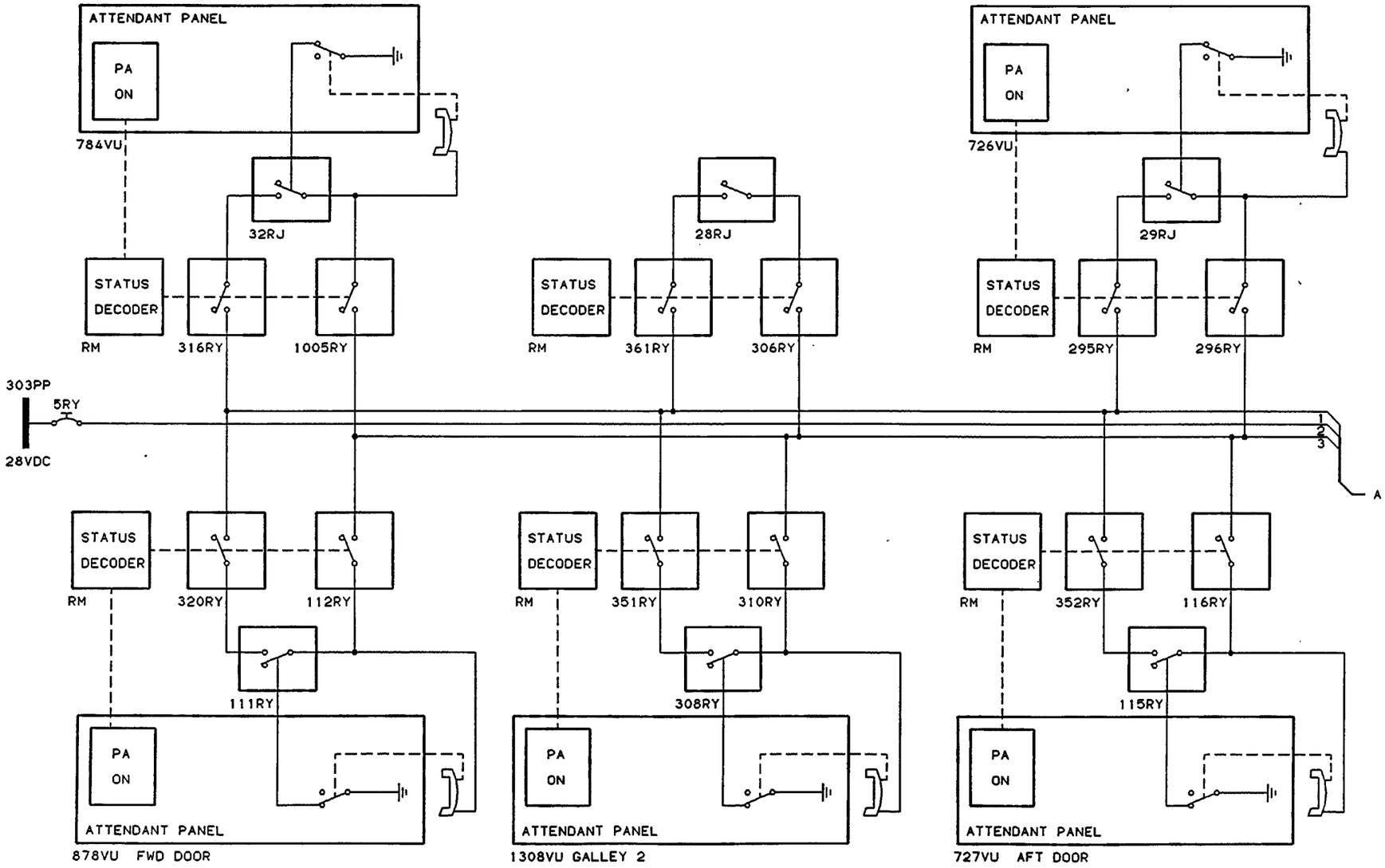
**ON A/C 101-200,

(Ref. Fig. 012)

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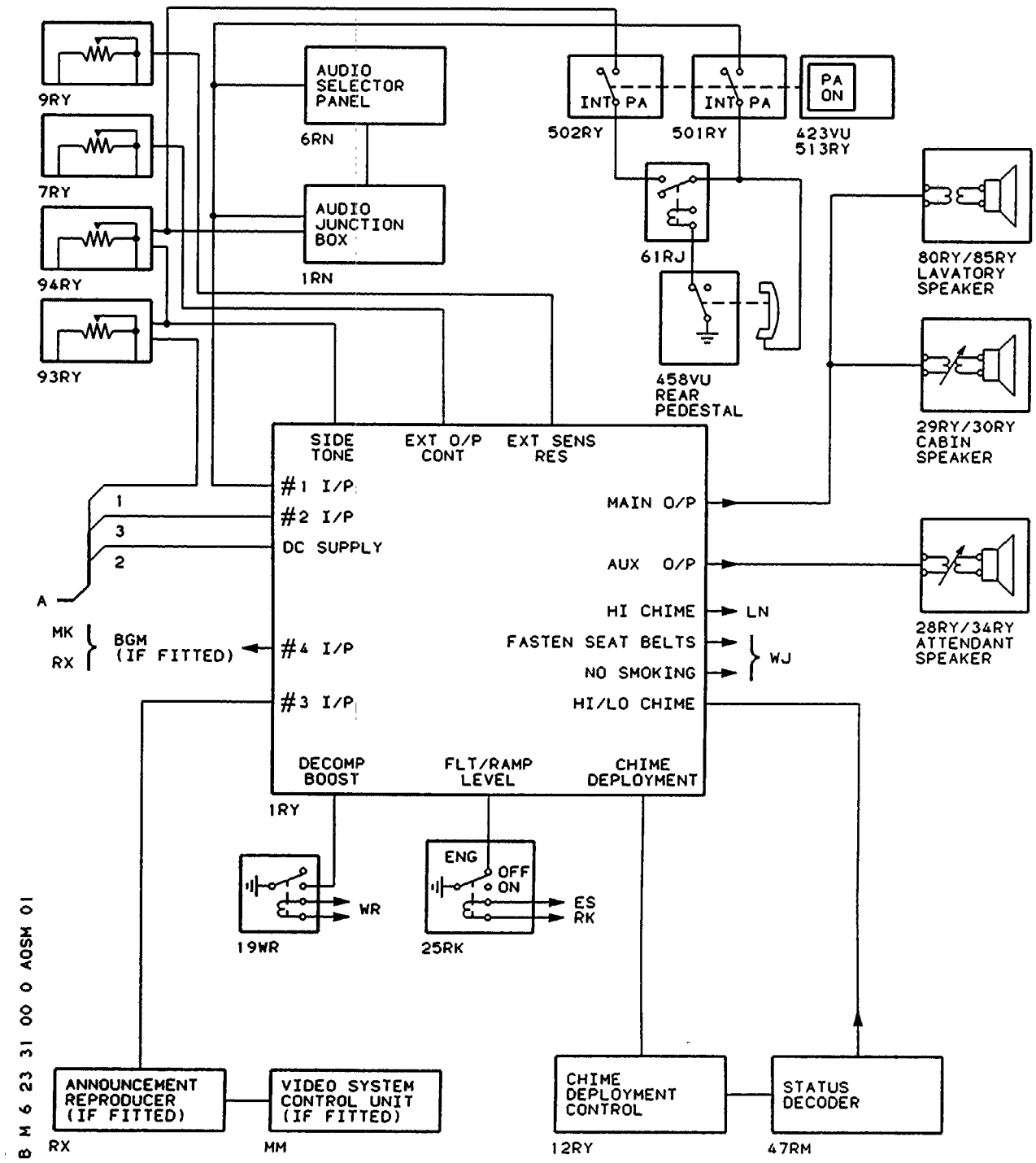


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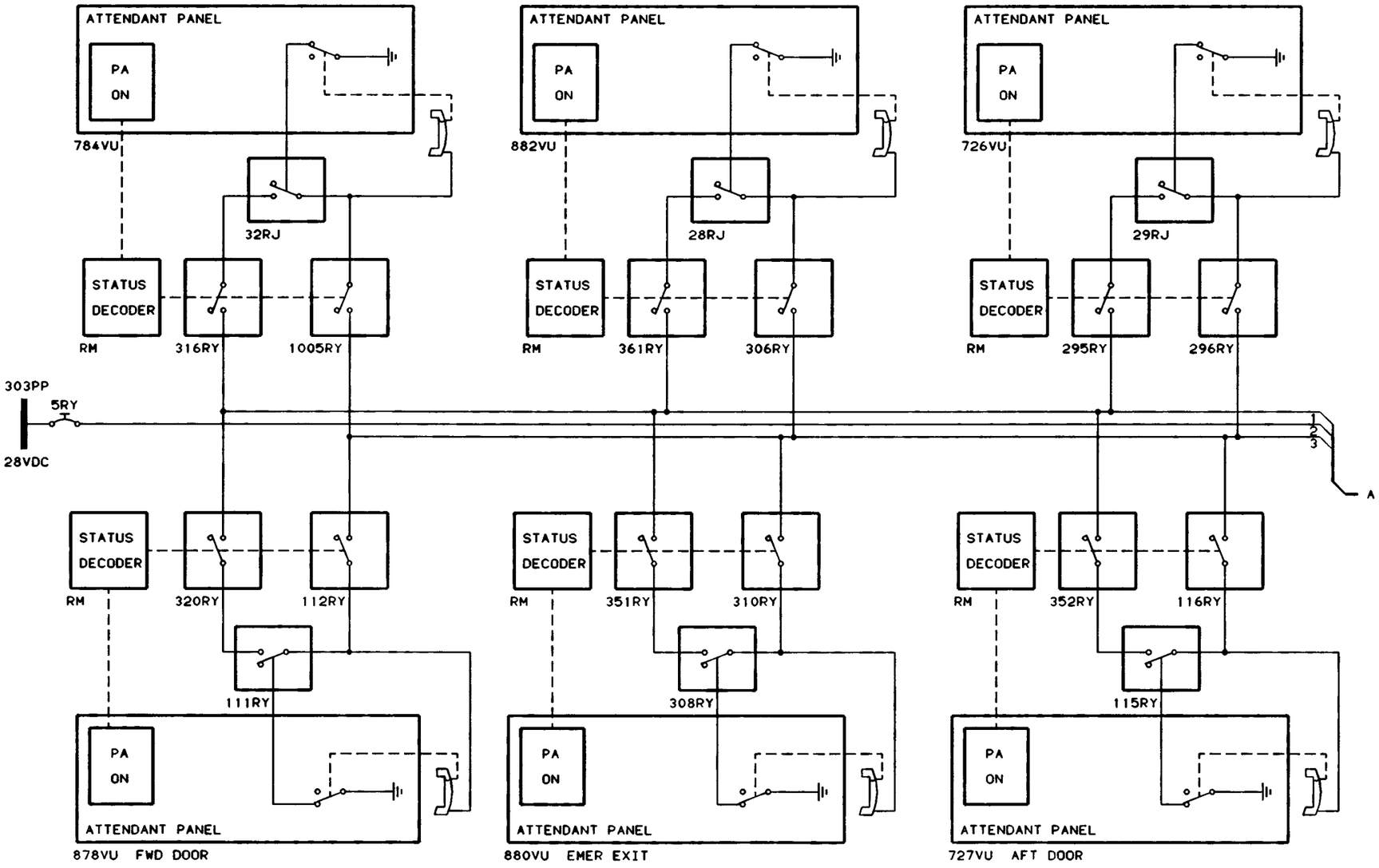

B M 6 23 31 00 0 AAAA 00

PA System Architecture (Sheet 1 of 2)
Figure 009



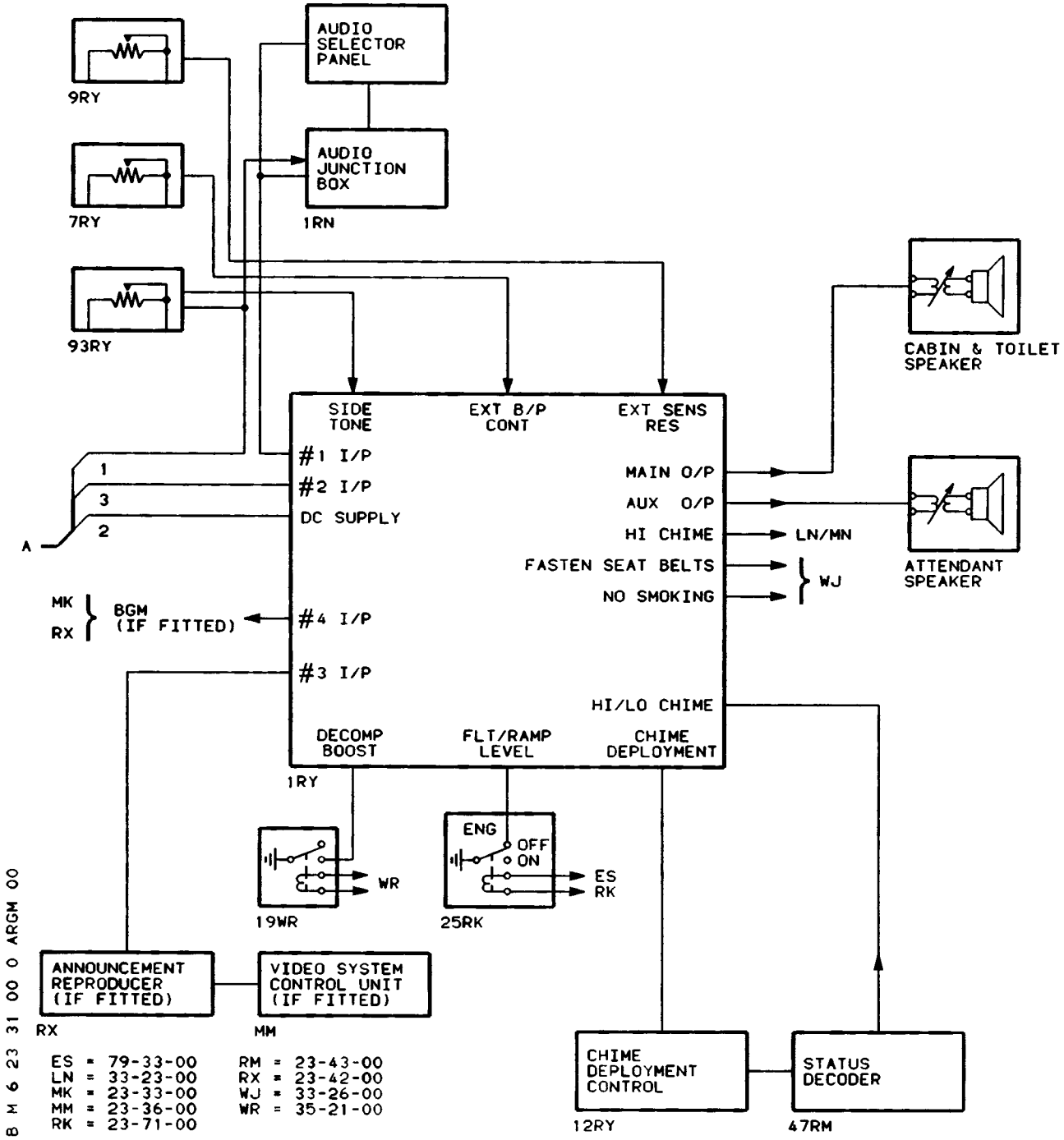

PA System Architecture (Sheet 2 of 2)
Figure 009

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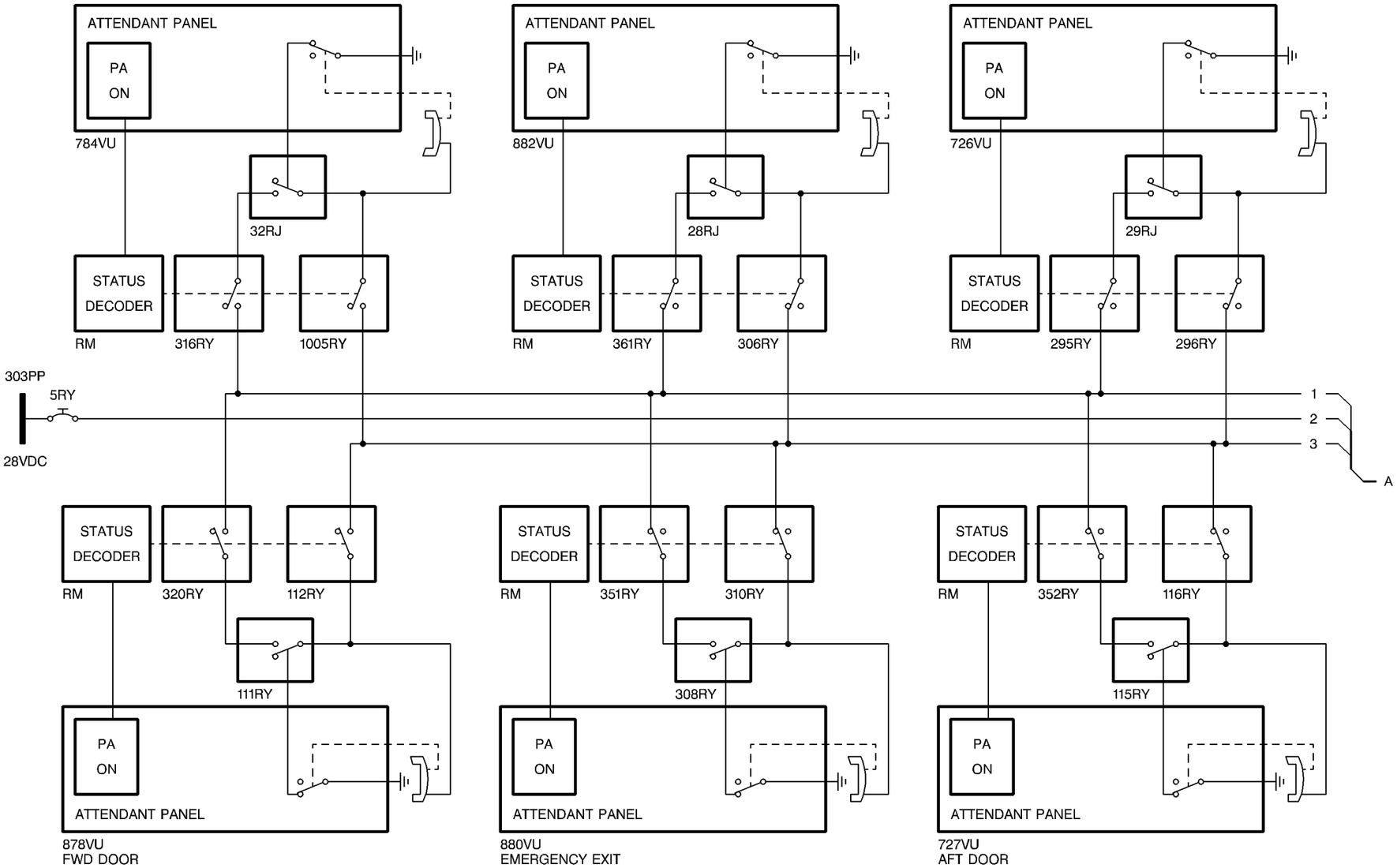

B M 6 23 31 00 0 ARGA 00

PA System Architecture (Sheet 1 of 2)
Figure 010



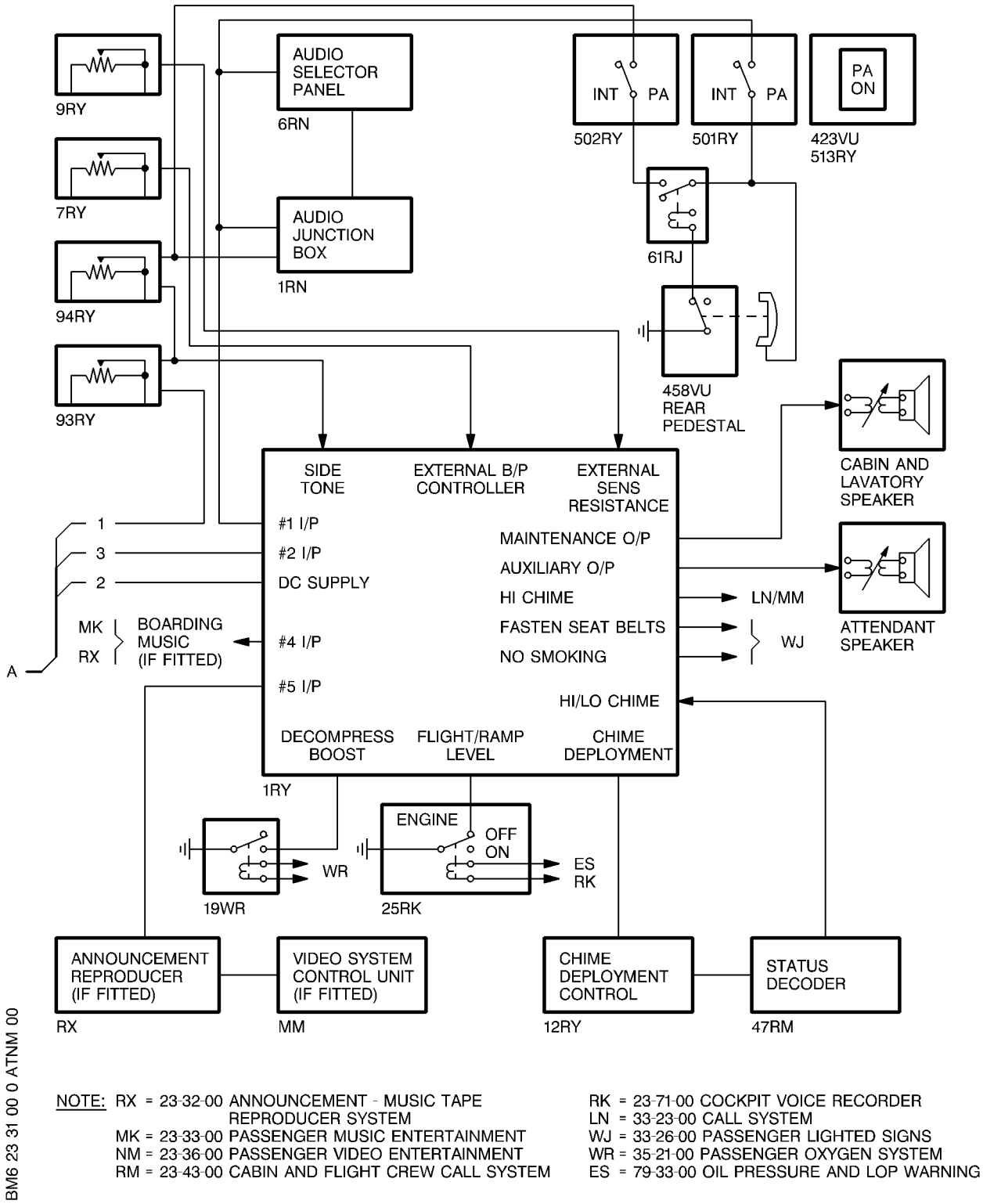

PA System Architecture (Sheet 2 of 2)
Figure 010

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BM6 23 31 00 0 ATNA 00

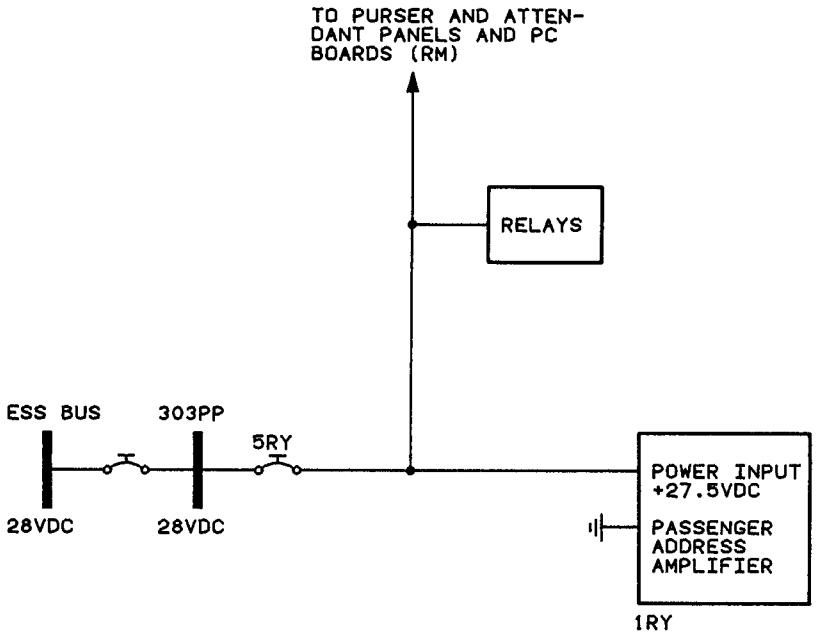
PA System Architecture (Sheet 1 of 2)
Figure 011




BM6 23 31 00 0 ATNM 00

NOTE: RX = 23-32-00 ANNOUNCEMENT - MUSIC TAPE REPRODUCER SYSTEM
MK = 23-33-00 PASSENGER MUSIC ENTERTAINMENT
NM = 23-36-00 PASSENGER VIDEO ENTERTAINMENT
RM = 23-43-00 CABIN AND FLIGHT CREW CALL SYSTEM
RK = 23-71-00 COCKPIT VOICE RECORDER
LN = 33-23-00 CALL SYSTEM
WJ = 33-26-00 PASSENGER LIGHTED SIGNS
WR = 35-21-00 PASSENGER OXYGEN SYSTEM
ES = 79-33-00 OIL PRESSURE AND LOP WARNING

PA System Architecture (Sheet 2 of 2)
Figure 011




B M 6 23 31 00 0 ATA0 01

Power Supply
Figure 012

R **ON A/C 001-104,

R Post SB 23-2082 For A/C 101-104,

(Ref. Fig. 013)

**ON A/C ALL

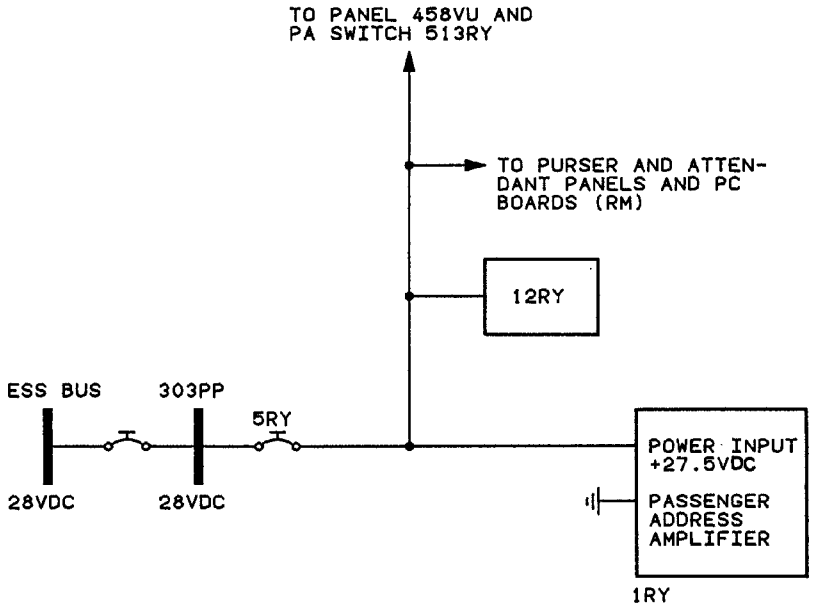
4. COMPONENT DESCRIPTION

A. PA Amplifier
The PA-Amplifier is a solid state audio amplifier that can be divided into the following basic functional units:
-power supply
-audio input control
-audio processor
-chime circuitry
-main power amplifier
-auxiliary power amplifier
-functional test circuitry

(1)Power Supply
The power supply unit consists of a regulated DC to DC converter which uses a pulse-width modulator, push-pull transformer circuitry to produce power amplifier voltages of +114 V DC, -114 V DC and 45 V DC. Three DC voltage regulators also provide +15 V DC, 10 V DC and 12 V DC regulated power sources.
(Ref. Fig. 014)
(Ref. Fig. 015)

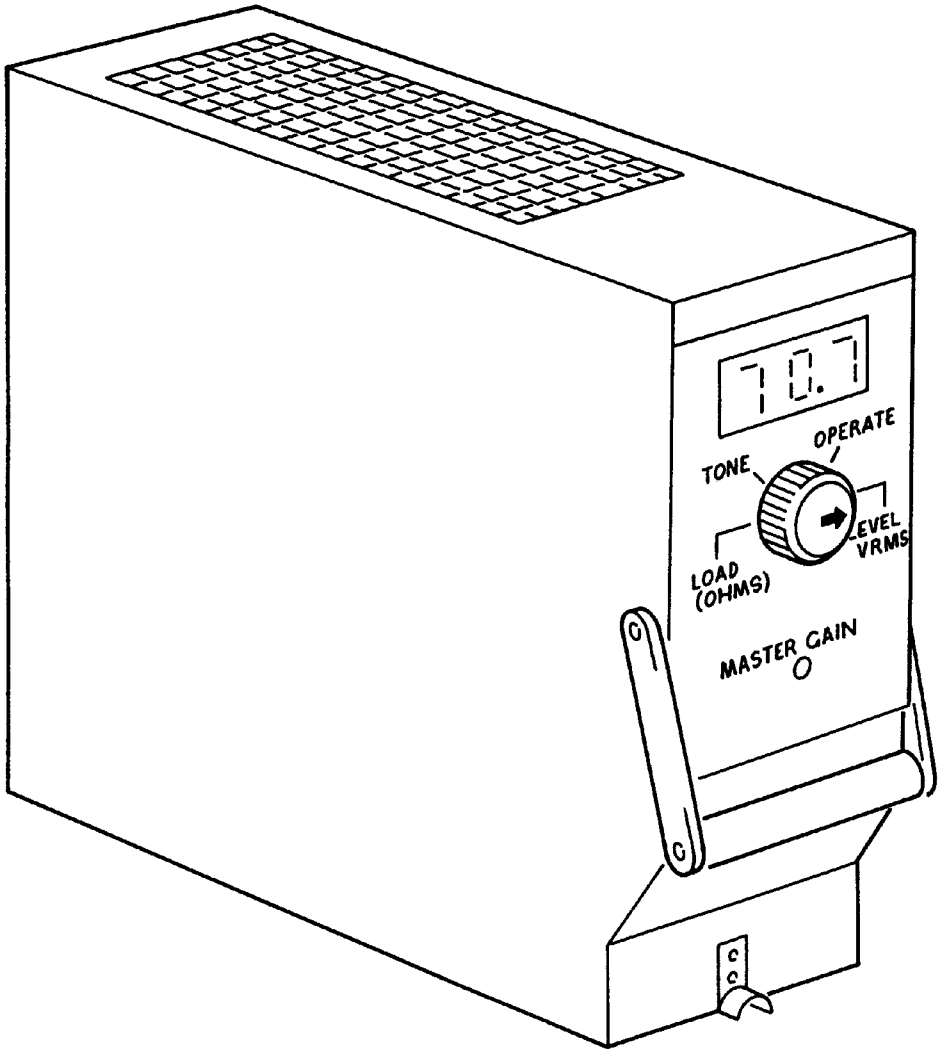
(2)Audio input control
This circuit provides the interface, priority switching logic and level control for the input signals from the flight crew and attendants handsets, inputs 1, 2 and 2a, prerecorded announcements/music and video reproducers input 3 and passenger entertainment reproducer, input 4. The control input lines are used to drive the logic control circuitry for priority switching. The order of priority from highest to lowest is input 1, 2/2a, 3 and 4 respectively.

(3)Audio Processor
(a)The audio input signals are routed through the appropriate signal conditioning circuits. All handset inputs (inputs 1, 2 and 2a), are routed to the externally controlled sensitivity control, compressor bass boost and summing pre-amplifier circuits. Input 1 and 2 are also monitored through the key click and audio blanking circuits which inhibit the amplifier output if switching positive or negative voltage transients appear at the inputs. Only input 1 is fed to the auxiliary summing pre-amplifier and auxiliary power amplifier circuits. Input 3 is switched directly to the main summing pre-amplifier while input 4 is tone contoured and then pre-amplified.
(b)External inputs, controlled by the A/C engine oil pressure switches




B M 6 23 31 00 0 ATD0 00

Power Supply
Figure 013



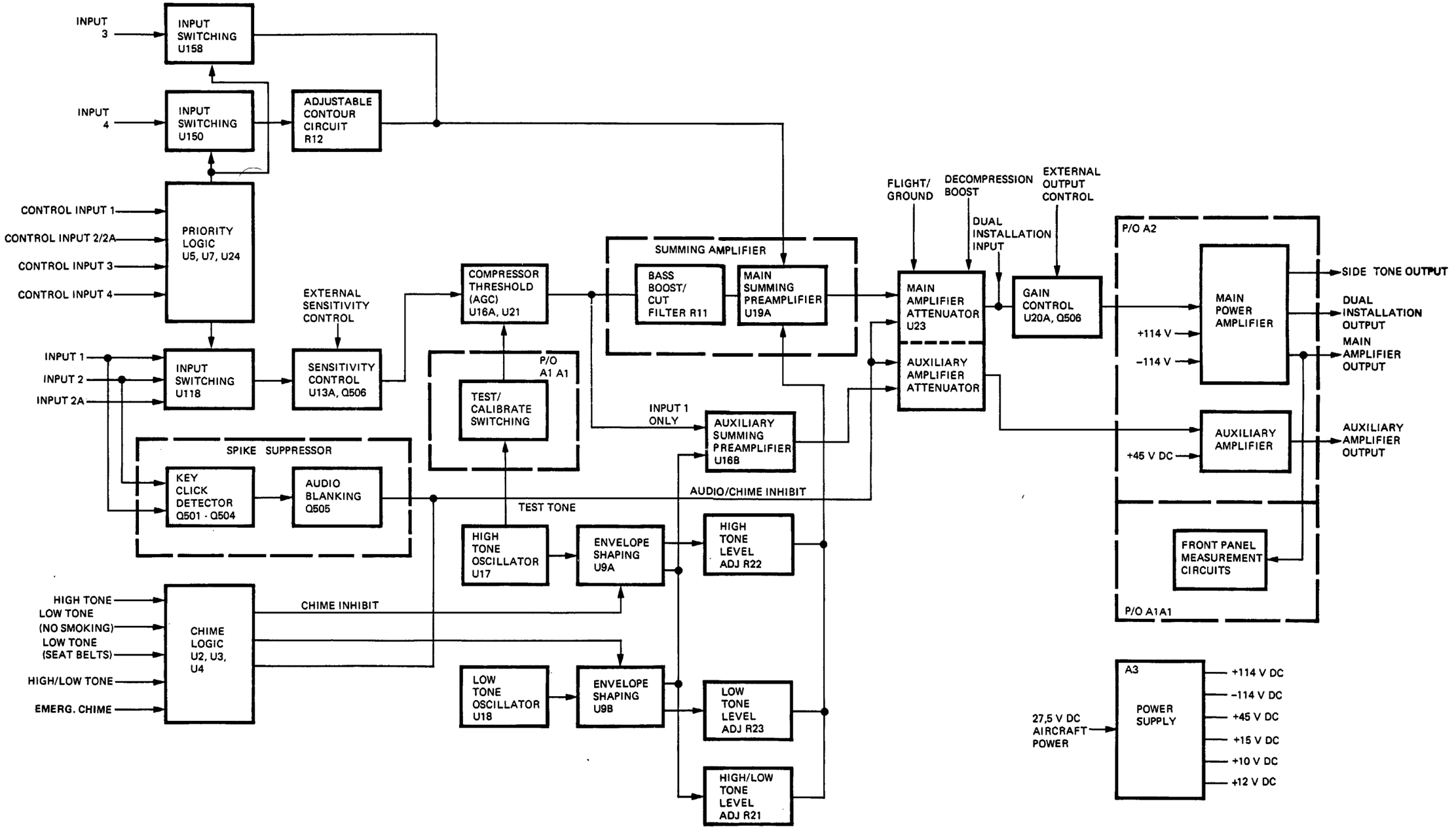

BM6 23 31 00 0 AUAO 00

PA-Amplifier
Figure 014

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BM6 23 31 00 0 AVBO 00

PA-Amplifier Block Diagram
Figure 015

and cabin pressure switches, are fed to the main amplifier attenuator circuits. Upon removal of a ground from the flight/ramp level terminal the main output of the PA-amplifier is increased by 6dB. When the DECOMPRESSION BOOST terminal is grounded the main amplifier output of the PA-amplifier is increased by a further 3dB.
The external control line input sets the power output of the main amplifier by controlling the attenuation of the output level control circuit.
(Ref. Fig. 016)

(4)Chime circuitry
The chime circuitry consists of input control, chime distribution logic, high and low-tone envelope shaping and oscillator circuits.
This circuit generates the HI and LO chime tones and controls the duration of each chime.
Four control lines are used to trigger the following tones:
- HIGH for passenger calls
- HIGH/LOW for an attendant call
- LOW to announce 'FASTEN SEAT BELT' and 'NO SMOKING'

All chime tones are distributed through the auxiliary power amplifier to the attendant loudspeakers. External jumper lines enable the presetting of selected chimes for distribution through the main amplifier over the cabin and lavatory loudspeakers.

**ON A/C 001-100,

(Ref. Fig. 017)

**ON A/C 101-200,

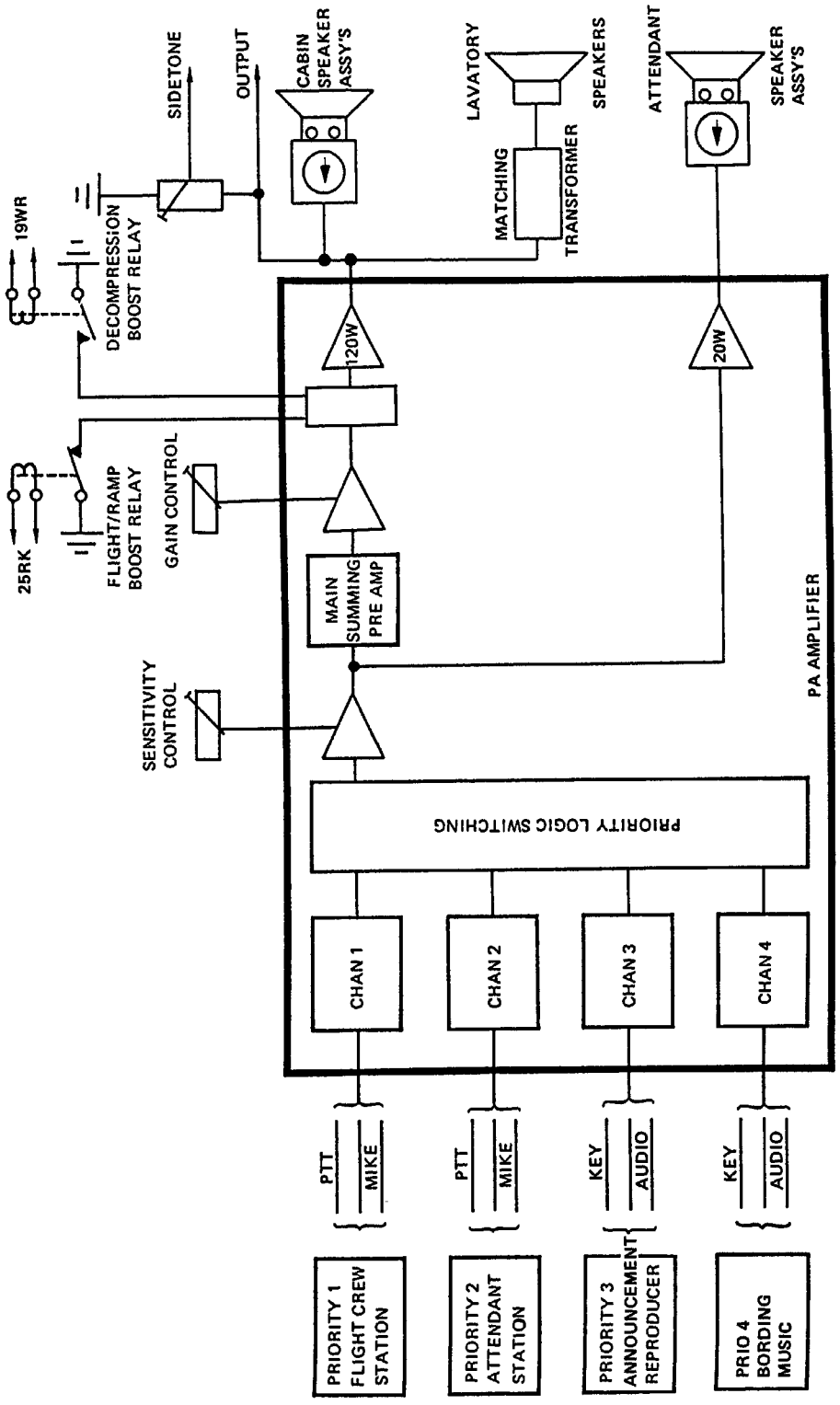
(Ref. Fig. 018)

**ON A/C ALL

(5)Main power amplifier
The main power amplifier receives the inputs from the gain control circuits and provides a main amplifier output to drive the cabin and lavatory loudspeakers, a sidetone output to drive the flight crew and attendant handsets and a dual installation output used only in conjunction with a second PA-amplifier.

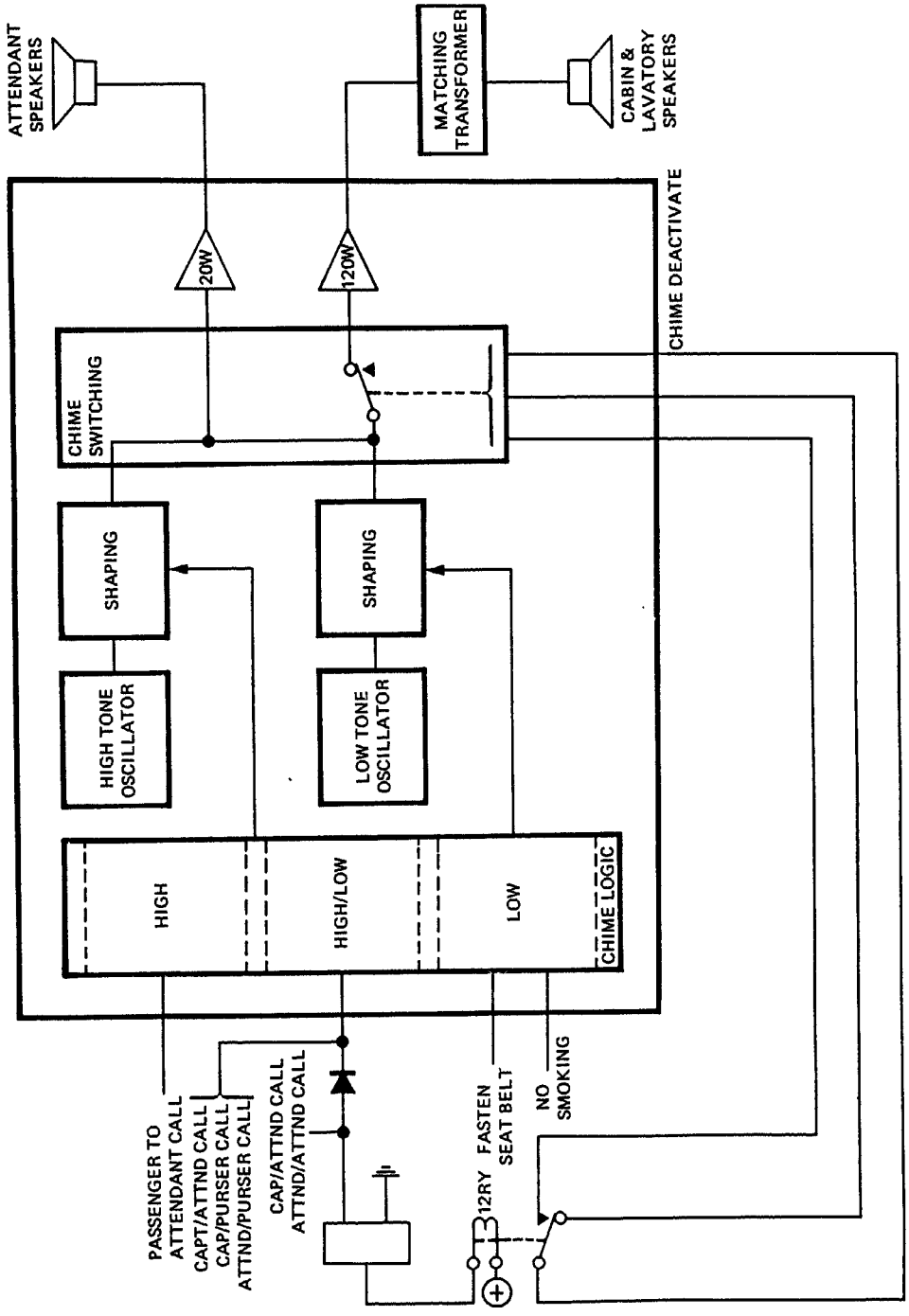
(6)Auxiliary power amplifier
The auxiliary power amplifier drives the attendant station loudspeakers only. Audio signals from the flight crew handsets and all chime signals are broadcast via the auxiliary amplifier.

(7)Functional test circuitry
The PA-amplifier contains an LED display, a four position (LOAD/TONE/OPERATE/LEVEL) switch and a gain adjustment potentiometer on the front panel to enable functional testing of the amplifier and the associated loudspeakers and adjustment the main output of the amplifier.
In the TONE position all audio inputs to the amplifier are disabled and a test tone is applied to the compressor circuit. The test tone is heard over the cabin, lavatory and attendant loudspeakers. In the LEVEL posi-



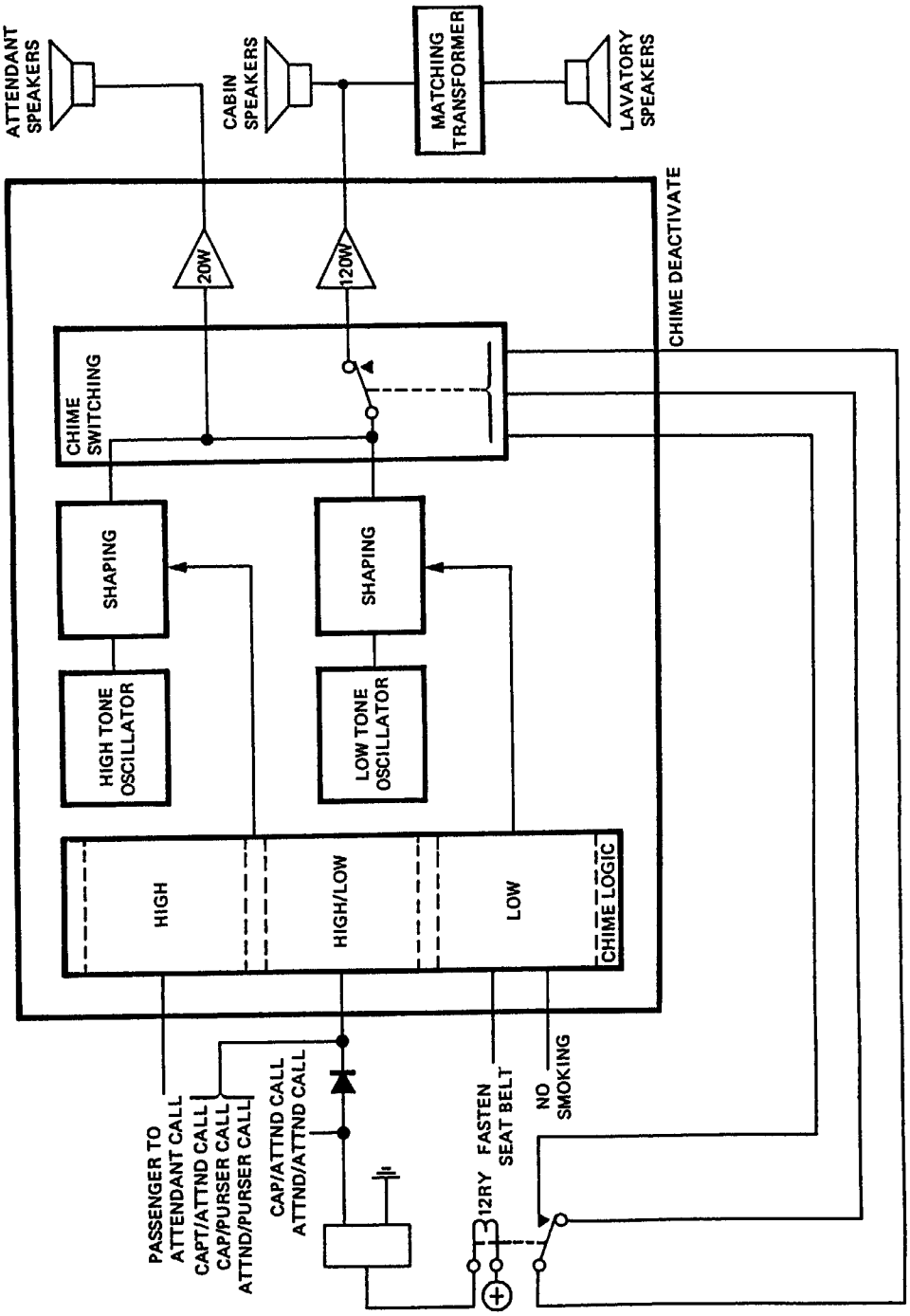

BM6 23 31 00 0 AWHO 00

Priority Block Diagram
Figure 016




BM6 23 31 00 0 AXAO 00

Chime Selection
Figure 017




BM6 23 31 00 0 AXFO 00

Chime Selection
Figure 018

tion, the audio inputs are disabled and the main power amplifier is switched to the external load. The main power output is measured at a frequency of 587 Hz and displayed (0 to 99,9 V rms). In this position the PA-amplifier can be adjusted for full power output. In the LOAD position the inputs to the unit are disabled and the magnitude of the impedance of the cabin and lavatory loudspeakers connected to the main amplifier is measured and displayed (0 to 999 OHM). In the OPERATE position the audio inputs to the PA-amplifier are enabled for normal operation.

B. Loudspeaker

Two types of loudspeaker assemblies, type A and B, with integral volume control, provide maximum sound coverage and optimum sound level for passengers and cabin attendants. A low impedance loudspeaker with matching transformer is fitted in each lavatory.

Type A loudspeaker assemblies are fitted at regular intervals along the hatrack columns and on the ceiling in the passenger compartment. They are connected across the main output of the PA-amplifier 1RY or 2RY (if fitted). Type B loudspeaker assemblies are fitted in the vicinity of cabin attendant stations and galley areas. They are connected across the auxiliary output of the amplifier 1RY or 2RY (if fitted).

Each of these assemblies comprise:

- a dynamic, low impedance, moving coil loudspeaker
- a step down transformer
- a five position rotary control switch

The sound output level of the assembly can be set by adjusting the position of the control switch as follows:

| SWITCH POSITION | SOUND PRESSURE |
|---|---|
| 1 | -12 dB |
| 2 | - 9 dB |
| 3 | - 6 dB |
| 4 | - 3 dB |
| 5 | 0 dB |

Loudspeakers in the lavatories are connected via matching transformers, to the main output of the PA-amplifier.

The sound level of the loudspeakers in the lavatories can be set by changing the tap connections on the transformer primary coil.

5. System Operation

A. Energization

When busbar 303PP is energized and circuit breaker 5RY closed, the passenger address amplifier(s) and associated control units are supplied with 28 V DC.

B. PA-Amplifiers

The PA-amplifier provides a main output to drive the cabin and lavatory loudspeaker, an auxiliary output to drive all attendant station loudspeaker and a side-tone output to drive the flight crew and attendant handsets.

R **ON A/C 001-104,

R Post SB 23-2082 For A/C 101-104,

C. Announcement from the Flight Crew Station
The PA System is selected by depressing the PA-pushbutton switch at any of the audio selector panels in the cockpit. Input 1 to the PA-amplifier is keyed when the push-to-talk (PTT) switch of the appropriate handset is pressed, enabling the flight crew announcement to be broadcast over all PA loudspeakers in cabin, lavatories and attendant stations. Any other audio output will be overridden. The output level of the earphone is adjustable by potentiometer 94RY.

**ON A/C 101-200,

C. Announcement from the Flight Crew Station
The PA-system is selected by depressing the PA-pushbutton switch at any of the audio selector panels in the cockpit. Input 1 to the PA-amplifier is keyed when the push-to-talk (PTT) switch of the appropriate hand microphone is pressed, enabling the flight crew announcement to be broadcast over all PA loudspeakers in cabin, lavatories and attendant stations. Any other audio output will be overridden. The output level of the headphones is adjustable by a potentiometer beside the PA-pushbutton switch.

**ON A/C 001-100,

(Ref. Fig. 019)

**ON A/C 101-200,

(Ref. Fig. 020)

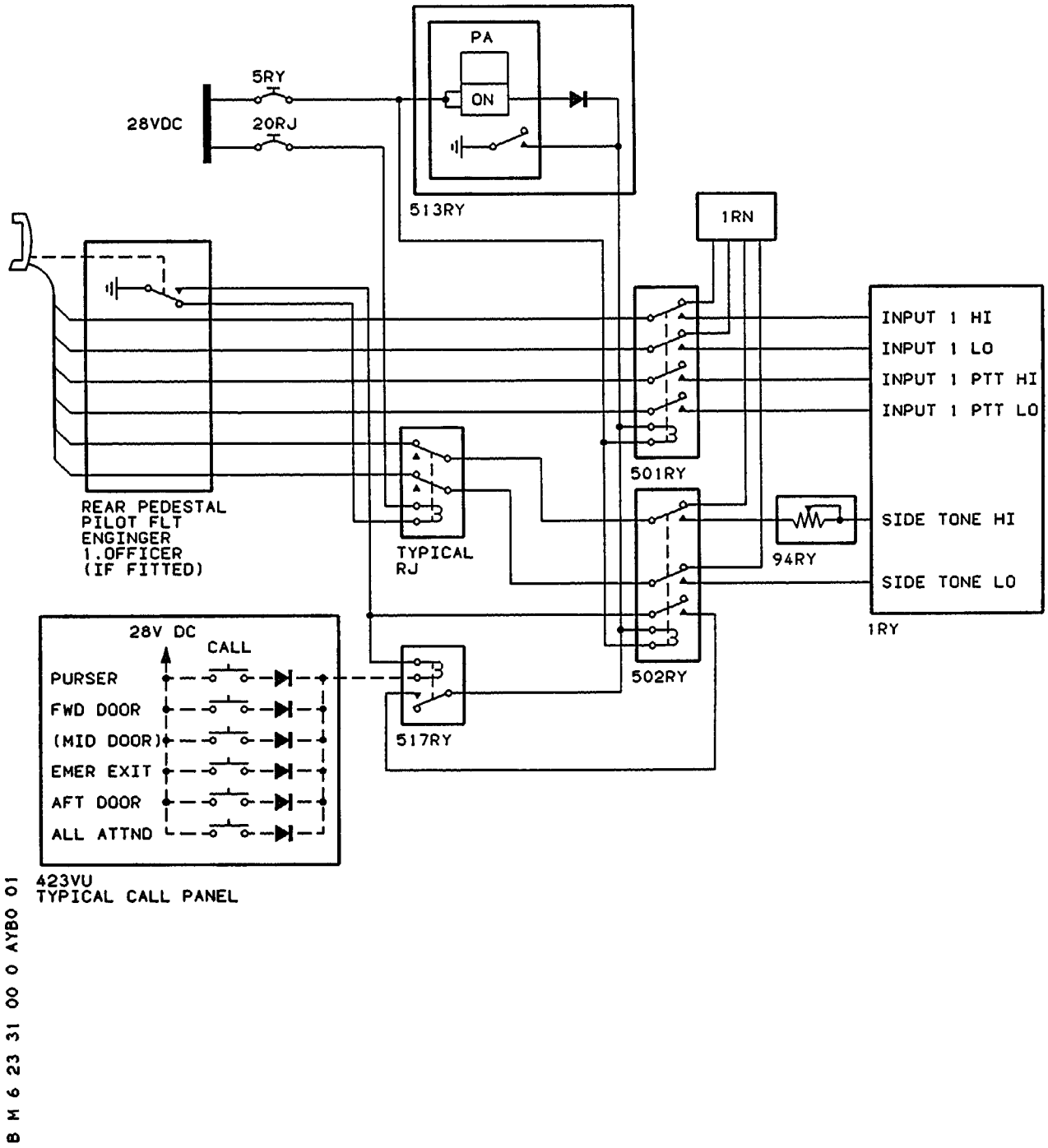
R **ON A/C 101-104,

R Post SB 23-2082 For A/C 101-104,

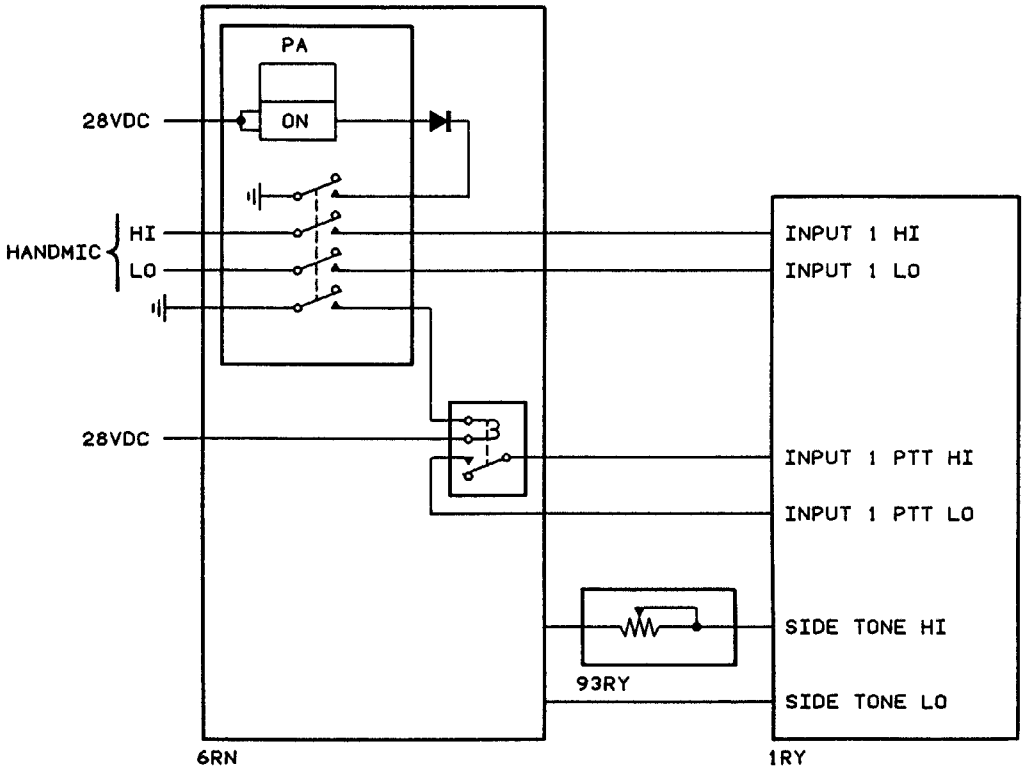
(Ref. Fig. 021)

**ON A/C ALL

D. Announcement from Purser or Attendant Station
When the handset is lifted and the momentary PA-pushbutton switch on the purser/attnd station is pressed, 28 V DC are fed to a master PC-board to energize associated relay which route the key and audio lines to the PA-amplifier and switch on the integral light emitting diode in the

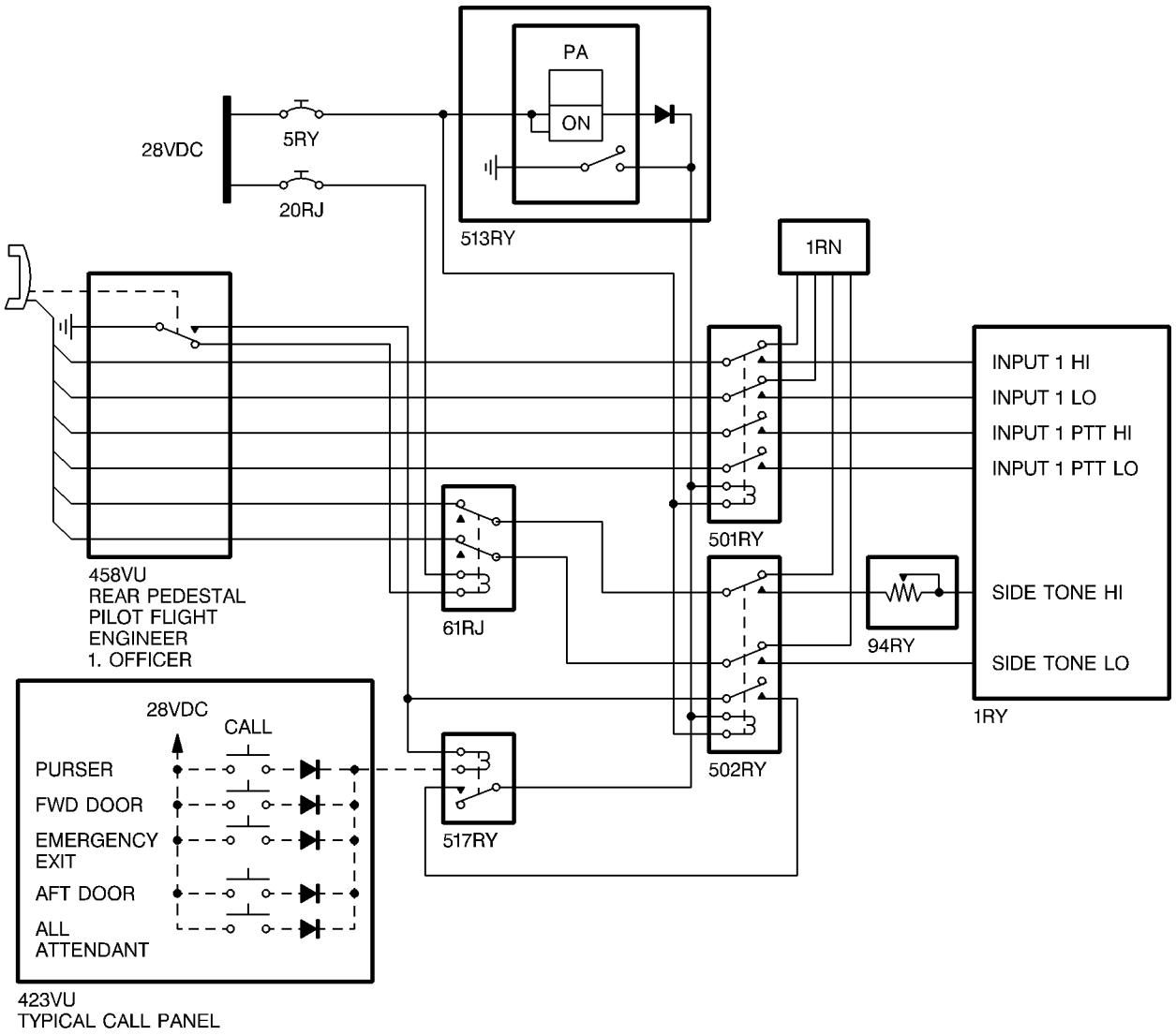



Flight Crew Announcement
Figure 019




B M 6 23 31 00 0 AYH0 00

Flight Crew Announcement
Figure 020




BM6 23 31 00 0 AYP0 00

Flight Crew Announcement
Figure 021

PA-pushbutton. A microswitch closes when the handset is removed from the holder to de-energize a relay and route the side-tone lines to the headset earphone. Input 2 to the PA-amplifier is keyed when the push-to-talk switch on the handset is operated enabling the announcement to be broadcast over the cabin and lavatory loudspeakers in the passenger compartment. The relays change over when the handset is replaced in the holder, opening the key and audio lines.
(Ref. Fig. 022)

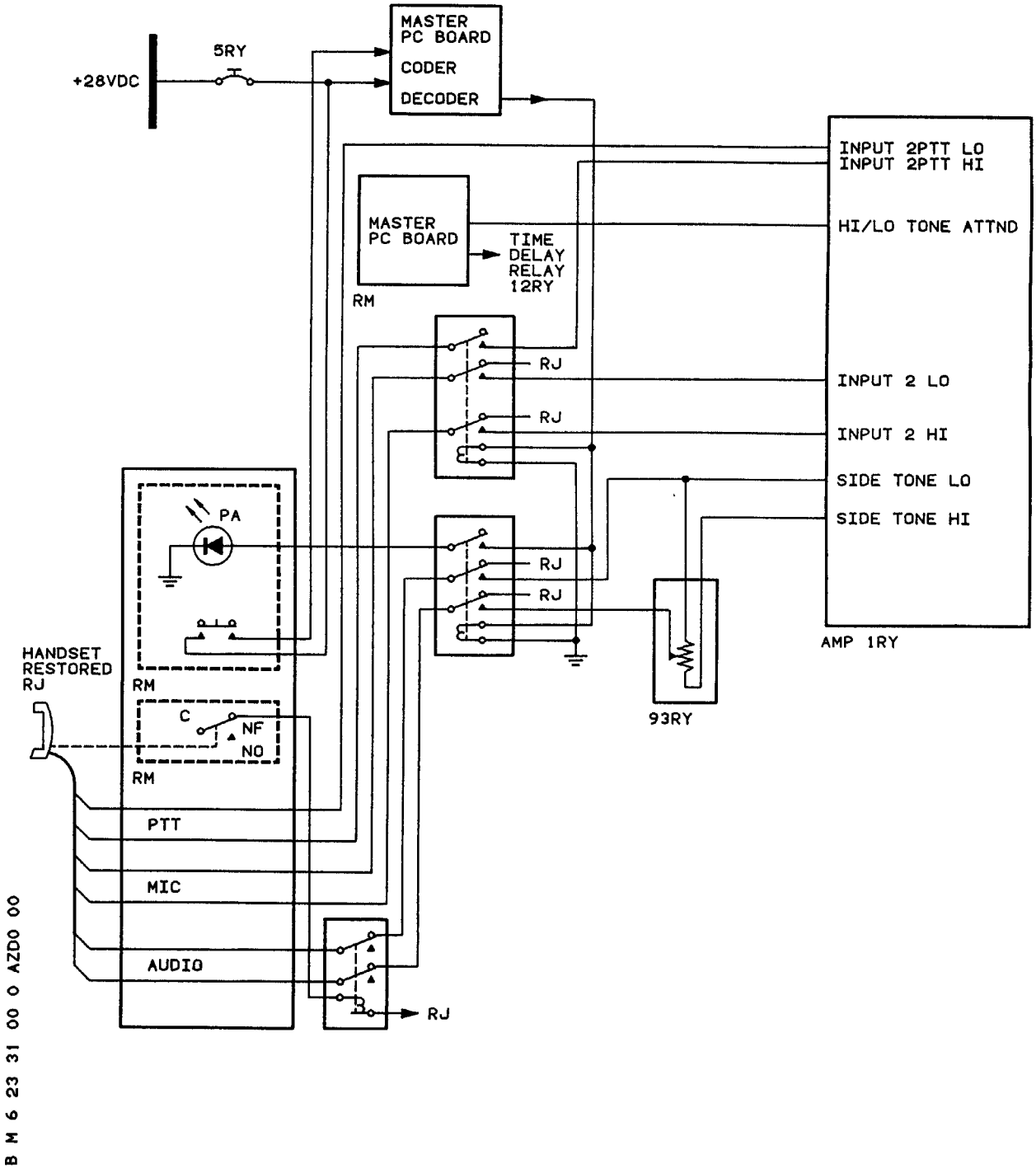
**ON A/C 001-100,

E. Chime Annunciation
ALL calls, if smoke is sensed by a lavatory smoke detector, and NO SMOKING and FASTEN SEAT BELT annunciation chimes are externally triggered by the respective systems are deployed over the loudspeakers as follows:

| FUNCTION | CHIME | DEPLOYMENT ZONE |
|---|---|---|
| PASSENGER TO ATTND CALL | HI | ATTENDANT STATIONS, CABIN + LAVATORIES |
| ATTENDANT TO ATTND CALL | HI/LO | ATTENDANT STATIONS ONLY |
| CAPTAIN TO PURSER CALL | HI/LO | ATTENDANT STATIONS, CABIN + LAVATORIES |
| CAPTAIN TO ATTND CALL | HI/LO | ATTENDANT STATIONS, CABIN + LAVATORIES |
| PURSER TO ATTENDANT CALL | HI/LO | ATTENDANT STATIONS, CABIN + LAVATORIES |
| ATTENDANT TO PURSER CALL | HI/LO | ATTENDANT STATIONS ONLY |
| NO SMOKING and FASTEN SEAT BELTS ANNUNCIATION | LO | ATTENDANT STATIONS, CABIN + LAVATORIES |
| LAVATORY SMOKE DETECTION | HI/LO | ATTENDANT STATIONS, CABIN + LAVATORIES |

**ON A/C 101-200,

E. Chime Annunciation
ALL calls, if smoke is sensed by a lavatory smoke detector, and NO SMOKING and FASTEN SEAT BELT annunciation chimes are externally triggered by the respective systems are deployed over the loudspeakers as follows:




Purser and Attendant Announcement
Figure 022

| FUNCTION | CHIME | DEPLOYMENT ZONE |
|---|---|---|
| PASSENGER TO ATTND CALL | HI | ATTENDANT STATIONS ONLY |
| ATTENDANT TO ATTND CALL | HI/LO | ATTENDANT STATIONS ONLY |
| CAPTAIN TO PURSER CALL | HI/LO | ATTENDANT STATIONS, CABIN + LAVATORIES |
| CAPTAIN TO ATTND CALL | HI/LO | ATTENDANT STATIONS ONLY |
| PURSER TO ATTENDANT CALL | HI/LO | ATTENDANT STATIONS, CABIN + LAVATORIES |
| ATTENDANT TO PURSER CALL | HI/LO | ATTENDANT STATIONS ONLY |
| NO SMOKING and FASTEN SEAT BELTS ANNUNCIATIN | LO | ATTENDANT STATIONS, CABIN + LAVATORIES |
| LAVATORY SMOKE DETECTION | HI/LO | ATTENDANT STATIONS, CABIN + LAVATORIES |

**ON A/C ALL

F. Audio Control

(1) The audio output level of the system may be set by adjusting the respective potentiometer as follows:

| | Amplifier 1RY | Amplifier 2RY (if fitted) |
|---|---|---|
| Amplifier gain | 7 RY | 14 RY |
| Input sensitivity | 9 RY | 8 RY |
| Sidetone ATTND HANDSETS | 93 RY | |
| Sidetone COCKPIT HANDSETS | 94 RY (if fitted) | |

(2) When both A/C engines are shut down, the FLT/RAMP terminal on each PA amplifier is grounded. When any A/C engine is running, an oil pressure switch operates to remove the ground from the FLT/RAMP terminal which increases the main output of the amplifier(s) by 6dB.

(3) In the event of a loss of cabin pressure at high altitude, relay 19WR in the passenger oxygen system operates to ground the DECOMPRESSION BOOST terminals of the PA-amplifier(s) and the main output of the amplifier(s) increase by a further 3dB.

6. Test

The rotary four-position switch and digital indicator on the front panel of each Pa-amplifier enables a function test of each amplifier to be performed as follows:

A. In the spring loaded LOAD position the impedance of the cabin and lavatory

loudspeakers fed by the PA-amplifier, is measured at a frequenzy of 587 Hz and displayed on the indicator (0 to 999 Ω).

B. In the TONE position a 587 Hz test tone is audible from the loudspeakers in the cabin, attendant stations and lavatories supplied by the amplifier.

C. In the LEVEL position the main output of the amplifier is measured and indicated (0 to 99.9 V rms). This allows the unit to be calibrate for full output power.

D. In the OPERATE position the amplifier operates in normal function.

1. Reason for the Job

A. Operational Test

B. Adjustment of Potentiometer

C. Adjustment of Transformer for Loudspeakers

2. Operational Test

A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz. |

Referenced Procedures

| | |
|---|---|
| - 23-32-00, P. Block 501 | Announcement - Music Tape Reproducer System |
| - 23-43-00, P. Block 501 | Cabin and Flight Crew Call System |
| - 23-50-00, P. Block 501 | Audio Integrating |
| - 33-23-00, P. Block 501 | Call System |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 23-33-00, P. Block 501 | Passenger Entertainment (Music) |
| - 33-26-00, P. Block 501 | Passenger Lighted Signs |

B. Procedure

(1)Job Set-Up

(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that electronics racks ventilation is correct.

(c)Make certain that the announcement - music tape reproducer system is working and that all selector pushbutton switches are in the inoperative position (Ref. 23-32-00, P. Block 501).

(d)Make certain that the passenger entertainment (music) system is working and selector pushbutton switches are in the inoperative position (Ref. 23-33-00, P. Block 501)

(e)Make certain that the cabin and flight crew call system is working and that all pushbutton switches are in the inoperative position (Ref. 23-43-00, P. Block 501).

(f)Make certain that the call system is working (Ref. 33-23-00, P. Block 501).

(g)Make certain that the audio integrating system is working (Ref. 23-50-00, P. Block 501).

(h)Make certain that passenger lighted signs system is working and the pushbutton switches NO SMOKING and SEAT BELT are in OFF position (Ref. 33-26-00, P. Block 501).

(j)At any flight crew's station connect a boomset to interphone connection at associated jack panel.

(k)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | P.A.OXYGEN CTL/WARN | 1WR | H24 |
| 22VU | P.A.OXYGEN ACTUATION | 2WR | H25 |

(l)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 133VU | OIL ENG 1 LO PRESS | 1ES | Q69 |
| 133VU | OIL ENG 2 LO PRESS | 2ES | Q72 |
| 22VU | COM PASSENGER ADDRESS | 5RY | B15 |
| 22VU | RCDR CTL | 5RK | F27 |

(2)Test

NOTE : In order to test the amplifier priority switching function, it is necessary to perform each input test while the previous input of lower priority is still being broadcast at speakers. While testing cabin attendant announcement priority, it may be necessary to select the tape announcement more than once.

**ON A/C 101-200,

(a)PA amplifier BITE test

| ACTION | RESULT |
|---|---|
| 1. At electronic rack, panel 96VU:<br>- place test switch on front of PA amplifier 1RY to LEVEL position (spring-loaded-position). | At PA amplifier 1RY front panel:<br>- display indicates 70,7 ± 3 V AC. |
| - place test switch on front of PA amplifier 1RY to TONE position (detent position). | Passenger compartment:<br>- test signal is broadcast at speakers in passenger compartment. |
| - place test switch on front of PA amplifier 1RY to LOAD position (spring-loaded-position). | Passenger compartment:<br>- test signal stops.<br>At PA amplifier front panel:<br>- display indicates a value higher than 30 Ohm.<br>NOTE : The load level depends on the various aircraft cabin configurations. |
| - place test switch to OPERATION position (detent position). | At PA amplifier front panel:<br>- display goes off. |

**ON A/C 001-100,

(a)PA amplifier BITE test

| ACTION | RESULT |
|---|---|
| 1. At electronic rack, panel 96VU:<br>- place test switch on front of PA amplifier 1RY to LEVEL position (spring-loaded-position). | At PA amplifier 1RY front panel:<br>- display indicates 70,7 ± 3 V AC. |
| - place test switch on front of PA amplifier 1RY to TONE position (detent position). | Passenger compartment:<br>- test signal is broadcast over speakers in passenger compartment. |
| - place test switch on front of PA amplifier 1RY to LOAD position (spring-loaded-position). | Passenger compartment:<br>- test signal stops.<br>At PA amplifier front panel:<br>- display indicates a value higher than 30 Ohm.<br>NOTE : The load level depends on the various aircraft cabin configurations. |
| - place test switch to OPERATION position (detent position). | At PA amplifier front panel:<br>- display goes off. |

**ON A/C 001-104,

Post SB 23-2082 For A/C 101-104,

(b)Test of System Inputs

| ACTION | RESULT |
|---|---|
| 1. Passenger Entertainment System (priority 4).<br>At purser's station, Attendant Control Unit (746VU):<br>- press pushbutton switch T/R TEST in'ON' position. | |
| At any passenger control unit:<br>- connect headset, select a music program. | At passenger control unit:<br>- selected music program is heard over headset. |
| 2. Announcement Reproducer 9RX (priority 3).<br>At purser's station, Attendant Control Unit 7RX: | At passenger control unit: |
| - select a prerecorded announcement. | - music program goes off, recorded announcement comes on.<br>In passenger compartment:<br>- check reception of recorded announcement at cabin, lavatory and attendants' speakers. |
| 3. Cabin Attendant's Announcement | |

| ACTION | RESULT |
|---|---|
| (priority 2).<br>At purser's station:<br>- lift handset, press PA pushbutton switch, press PTT pushbutton on handset and make an announcement while prerecorded announcement is being made. | In passenger compartment:<br>- check reception of announcement from attendant's station at cabin and lavatory speakers.<br>At attendants' stations:<br>- integral light in PA pushbutton switch comes on. |
| - replace handset | - integral light in PA pushbutton goes off. |
| - repeat test from all other attendants' stations. | - same result as above. |
| 4. Flight Crew Announcement<br>(priority 1).<br>At flight crew station with boomset connected:<br>- place MASK - PA switch in PA position and make announcement while purser's announcement is being made. | In passenger compartment:<br>- check reception of announcement from flight crew station at cabin, attendants' stations and lavatory speakers. |
| - place PA switch in OFF position. | - check announcement from purser's station is received at cabin and lavatory speakers. |
| At flight crew station:<br>- lift handset at pedestal.<br>- press pushbutton switch PA on panel 423VU. | On panel 423VU:<br>- integral light in pushbutton switch PA comes on. |
| - press PTT pushbutton and make an announcement while purser's announcement is being made. | In passenger compartment:<br>- check reception of announcement from captain's station at cabin, attendants' stations and lavatory speakers. |
| - release PTT pushbutton and replace handset. | - check announcement from purser's station is received at cabin and lavatory speakers.<br>On panel 423VU:<br>- integral light in PA pushbutton goes off. |
| At purser's station:<br>- release PTT pushbutton and replace handset. | In passenger compartment:<br>- check recorded announcement is received at cabin, lavatory and attendants' speakers.<br>- integral light in PA pushbutton goes off. |
| At purser's station, Attendant Control Unit 7RX:<br>- press cancel pushbutton. | In passenger compartment:<br>- check recorded announcement stops.<br>At passenger control unit:<br>- music program comes on. |

| ACTION | RESULT |
|---|---|
| - press pushbutton switch T/R TEST to OFF position. | - music program stops. |

**ON A/C 101-200,

(b)Test of System Inputs

| ACTION | RESULT |
|---|---|
| 1. Passenger Entertainment System (priority 4). At any passenger control unit: | At passenger control unit: |
| - connect headset, select a music program. | - selected music program is heard over headset. |
| 2. Announcement Reproducer 9RX (priority 3). At purser's station, Attendant Control Unit 7RX: | At passenger control unit: |
| - select a prerecorded announcement. | - music program goes off, recorded announcement comes on. In passenger compartment: |
| | - check reception of recorded announcement at cabin, lavatory and attendants' speakers. |
| 3. Cabin Attendant's Announcement (priority 2). At purser's station: | In passenger compartment: |
| - lift handset, press PA pushbutton switch, press PTT pushbutton on handset and make an announcement while prerecorded announcement is being made. | - check reception of announcement from purser's station in cabin and lavatory speakers. At attendants' stations: - integral light in PA pushbutton switch comes on. |
| - replace handset | - integral light in PA pushbutton goes off. |
| - repeat test from all other attendants' stations. | - same result as above. |
| 4. Flight Crew Announcement (priority 1). At flight crew station with boomset connected: | In passenger compartment: |
| - place MASK - PA switch on audio selector panel in 'PA' position and make announcement while purser's announcement is being made. | - check reception of announcement from flight crew station at cabin, lavatory and attendants' speakers. |
| - place 'PA' switch in OFF position. | - check announcement from purser's station is received at cabin and lavatory speakers. |

| ACTION | RESULT |
|---|---|
| At purser's station:<br>- release PTT pushbutton and replace handset. | In passenger compartment:<br>- check recorded announcement is received at cabin, lavatory and attendants' speakers<br>- integral light in PA pushbutton goes off. |
| At purser's station:<br>- press cancel pushbutton. | In passenger compartment:<br>- check recorded announcement stops.<br>At passenger control unit:<br>- music program comes on. |

(c)Test of Chime Annunciation.

| ACTION | RESULT |
|---|---|
| 1. On panel 423VU:<br>- press the following pushbutton switches in turn.<br>PURS CALL | In passenger compartment:<br>- Check HI/LO chime is heard at the following stations.<br>- over speakers in cabin, lavatories and attendant stations. |
| FWD DOOR CALL | - over speakers at attendant stations. |
| EMER EXIT CALL | - over speakers at attendant stations. |
| AFT DOOR CALL | - over speakers at attendant stations. |
| ALL ATTND | - over speakers at cabin, lavatories and attendant stations. |
| 2. On purser's station control panel:<br>- press pushbutton switch ALL ATTND. | In passenger compartment:<br>- check HI/LO chime is heard over speakers at cabin and attendant stations. |
| - press pushbutton switch 1R. | - check HI/LO chime is heard over speakers at cabin and attendant stations. |
| - press pushbutton switch 2L/R. | - check HI/LO chime is heard over speakers at cabin and attendant stations. |
| - press pushbutton switch 3L/R. | - check HI/LO chime is heard over speakers at cabin and attendant stations. |
| 3. At FWD DOOR attendant station:<br>- press pushbutton switch PURS. | In passenger compartment:<br>- check HI/LO chime is heard over speakers at attendant stations. |
| - press pushbutton switch 2L/R. | - check HI/LO chime is heard over speakers at attendant stations. |
| - press pushbutton switch 3L/R. | - check HI/LO chime is heard over speakers at attendant stations. |
| 4. At EMER DOOR attendant station: | In passenger compartment: |

| ACTION | RESULT |
|---|---|
| - press pushbutton switch PURS. | - check HI/LO chime is heard over speakers at attendant stations. |
| - press pushbutton switch 1R. | - check HI/LO chime is heard over speakers at attendant stations. |
| - press pushbutton switch 3L/R. | - check HI/LO chime is heard over speakers at attendant stations. |
| 5. At AFT DOOR attendant station: | In passenger compartment: |
| - press pushbutton switch PURS. | - check HI/LO chime is heard over speakers at attendant stations. |
| - press pushbutton switch 1R. | - check HI/LO chime is heard over speakers at attendant stations. |
| - press pushbutton switch 2L/R. | - check HI/LO chime is heard over speakers at attendant stations. |
| 6. In passenger compartment: | In passenger compartment: |
| - press one call button over any seat. | - check HI tone chime is heard over speakers at cabin purser's and attendant stations. |
| 7. In each lavatory in turn: | In passenger compartment: |
| - press attendant call switch. | - check HI tone chime is heard over speakers at cabin purser's and attendant stations. |
| 8. On panel 423VU: | In passenger compartment: |
| - place SEAT BELTS switch in SEAT BELTS position. | - check LO chime is heard in cabin, lavatory, cabin attendant's and purser's speakers. |
| - place SEAT BELTS switch in OFF position. | - check LO chime is heard in cabin, lavatory, cabin attendant's and purser's speakers. |
| - place NO SMOKING switch in ON position. | - check LO chime is heard in cabin, lavatory, cabin attendant's and purser's speakers. |
| - place NO SMOKING switch in OFF position. | - check LO chime is heard in cabin, lavatory, cabin attendant's and purser's speakers. |

**ON A/C 001-100,

(c)Test of Chime Annunciation

| ACTION | RESULT |
|---|---|
| 1. On panel 423VU: | In passenger compartment: |
| - press the following pushbutton switches in turn. | - Check HI/LO chime is heard at the following stations. |
| PURS CALL | - over speakers in cabin, lavatories and attendants' stations. |
| MID GALY CALL | - over speakers at attendants' stations. |

| ACTION | RESULT |
|---|---|
| FWD DOOR CALL | - over speakers at attendants' stations. |
| AFT DOOR CALL | - over speakers at attendants' stations. |
| ALL ATTND | - over speakers at attendants' stations. |
| 2. On purser's station control panel:<br>- press pushbutton switch ALL ATTND. | In passenger compartment:<br>- check HI/LO chime is heard over speakers at cabin, lavatories and attendants' stations. |
| - press pushbutton switch 1R. | - check HI/LO chime is heard over speakers at cabin, lavatories and attendants' stations. |
| - press pushbutton switch MID GALY. | - check HI/LO chime is heard over speakers at cabin, lavatories and attendants' stations. |
| - press pushbutton switch 3L/R. | - check HI/LO chime is heard over speakers at cabin, lavatories and attendants' stations. |
| 3. At FWD DOOR attendants' stations:<br>- press pushbutton switch PURS. | In passenger compartment:<br>- check HI/LO chime is heard over speakers at attendants' stations. |
| - press pushbutton switch MID GALY. | - check HI/LO chime is heard over speakers at attendants' stations. |
| - press pushbutton switch 3L/R. | - check HI/LO chime is heard over speakers at attendants' stations. |
| 4. At MID GALY attendant's station:<br>- press pushbutton switch PURS. | In passenger compartment:<br>- check HI/LO chime is heard over speakers at attendants' stations. |
| - press pushbutton switch 1R. | - check HI/LO chime is heard over speakers at attendants' stations. |
| - press pushbutton switch 3L/R. | - check HI/LO chime is heard over speakers at attendants' stations. |
| 5. At AFT DOOR attendants' stations:<br>- press pushbutton switch PURS. | In passenger compartment:<br>- check HI/LO chime is heard over speakers at attendants' stations. |
| - press pushbutton switch 1R. | - check HI/LO chime is heard over speakers at attendants' stations. |
| - press pushbutton switch MID GALY. | - check HI/LO chime is heard over speakers at attendants' stations. |
| 6. In passenger compartment:<br>- press one call button over any seat. | In passenger compartment:<br>- check HI tone chime is heard over speakers at attendants' stations. |
| 7. In each lavatory in turn:<br>- press attendant call switch. | In passenger compartment:<br>- check HI tone chime is heard over speakers at attendants' stations. |
| 8. On panel 423VU:<br>- place SEAT BELTS switch in SEAT BELTS position. | In passenger compartment:<br>- check LO tone chime is heard over speakers at cabin, lavatories |

| ACTION | RESULT |
|---|---|
| | and attendants' stations. |
| - place **SEAT BELTS** switch in **OFF** position. | - check LO tone chime is heard over speakers at cabin, lavatories and attendants' stations. |
| - place **NO SMOKING** switch in **ON** position. | - check LO tone chime is heard over speakers at cabin, lavatories and attendants' stations. |
| - place **NO SMOKING** switch in **OFF** position. | - check LO tone chime is heard over speakers at cabin, lavatories and attendants' stations. |

**ON A/C ALL

(d)Test of Audio Level at Flight/Ramp and Decompression

| ACTION | RESULT |
|---|---|
| 1. Flight/Ramp | |
| On panel 22VU: | In passenger compartment: |
| - while making an announcement from a cabin attendant station, open circuit breaker 5RK. | - check audio level increases at cabin, lavatory and attendant's speakers. |
| - close circuit breaker 5RK. | - check audio level decreases. |
| 2. Decompression Boost | |
| On relay 19WR in panel 282VU: | In passenger compartment: |
| - bridge contact A and 2. | - check audio level during emergency oxygen mask announcement from pre-recorded announcement system is higher than audio level during other announcements. |
| - remove bridge from contacts A and 2. | |

C. Close-Up

(1)Close circuit breakers 1WR and 2WR.

(2)Remove boomset from flight crew station jack panel.

(3)Make certain that working area is clean, and clear of tools and miscellaneous items of equipment.

(4)De-energize electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).

**ON A/C 101-200,

(Ref. Fig. 501)

3. Adjustment of Potentiometers

A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz. |
| (2) | 2 Multimeters (min. 20 k Ω). |
| (3) | Test Box |
| (4) | 1 Tone Generator |

Referenced Procedure

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |

B. Procedure

(1)Job Set-Up

(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that electronics racks ventilation is correct.

(c)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | COM PASSENGER ADDRESS | 5RY | B 15 |
| 22VU | RCDR CTL | 5RK | F 27 |

(2)Adjustment

(a)Adjustment of output and sensitivity potentiometers of PA amplifier.
Check correct adjustment of audio volume potentiometer as follows:

1 In avionics compartment on RH electronics rack 90VU, remove panel 97VU, disconnect electrical plug 168VC A.

2 Connect the ohmmeter between -A and -B of connector socket
R 168VC and adjust potentiometer 7RY to obtain a resistance of 0 Ω,
R the tolerance is plus 2 Ω.

3 Connect the ohmmeter between -C and -D of connector socket
R 168VC and adjust potentiometer 9RY to obtain a resistance of 0 Ω,
R the tolerance is plus 2 Ω.

4 Reconnect electrical plug 168VC A and replace panel 97VU.

(b)Adjustment of sidetone potentiometer 93RY for attendant handsets in cabin compartment.

NOTE : For connection of electrical test equipment use shielded leads only.

1 Remove safety clips and tags and close circuit breakers: 5RY and 5RK.

2 On purser station 878VU disconnect handset from electrical socket 1188VC.

3 Connect test box to connector socket 1188VC and handset to test box (all switches on test box in OFF position).

4 Connect tone generator (impedance 50 Ω) to mic jacks 1.

5 Connect AC - voltmeter 1 to mic jacks 2.

6 Connect AC - voltmeter 2 to audio jacks.

7 On test box switch 'GENERATOR' and 'MIC' switch to ON.
8 On panel 878VU press pushbutton on PA.
9 Adjust tone generator to 1000 Hz, 50 mV.
10 On test box set PTT switch to ON.
11 Adjust potentiometer 93RY on panel 97VU to 300 ± 30mV indicated on AC-voltmeter 2 in audio jacks. If necessary, adjust tone generator output (50 mV) for correct voltage.
12 Disconnect test box; replace and connect handset to electrical socket 1188VC on panel 878VU.

**ON A/C 001-100,

(Ref. Fig. 501)

3. Adjustment of Potentiometers

A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz. |
| (2) | 2 Multimeters (min. 20 k Ω). |
| (3) | Test Box |
| (4) | 1 Tone Generator |

Referenced Procedures
- 24-41-00, P. Block 301 AC External Power Control

B. Procedure
(1)Job Set-Up
(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | COM PASSENGER ADDRESS | 5RY | B 15 |
| 22VU | RCDR CTL | 5RK | F 27 |

(2)Adjustment
(a)Adjustment of output and sensitivity potentiometers of PA amplifier. Check correct adjustment of audio volume potentiometer as follows:
1 In avionics compartment on RH electronics rack 90VU, remove panel 97VU, disconnect electrical plug 168VC A.
2 Connect the ohmmeter between -A and -B of connector socket 168VC and adjust potentiometer 7RY to obtain a resistance of 0 +2 Ω.
3 Connect the ohmmeter between -C and -D of connector socket

168VC and adjust potentiometer 9RY to obtain a resistance of 0 +2 Ω.
4 Reconnect electrical plug 168VC A and replace panel 97VU.

(b)Adjustment of sidetone potentiometer 93RY for attendant handsets in cabin compartment.

NOTE : For connection of electrical test equipment use shielded leads only.

1 Remove safety clips and tags and close circuit breakers: 5RY and 5RK.
2 On purser station 878VU disconnect handset from electrical socket 1188VC.
3 Connect test box to electrical socket 1188VC and handset to test box (all switches on test box in OFF position).
4 Connect tone generator (impedance 50 Ω) to mic jacks 1.
5 Connect AC - voltmeter 1 to mic jacks 2.
6 Connect AC - voltmeter 2 to audio jacks.
7 On test box switch 'GENERATOR' and 'MIC' switch to ON.
8 On panel 878VU press pushbutton on PA.
9 Adjust tone generator to 1000 Hz, 50 mV.
10 On test box set PTT switch to ON.
11 Adjust potentiometer 93RY on panel 97VU to 300 ± 30 mV indicated on AC-voltmeter 2 in audio jacks. If necessary, adjust tone generator output (50 mV) for correct voltage.
12 Disconnect test box; replace and connect handset to electrical socket 1188VC on panel 878VU.

(c)Adjustment of sidetone potentiometer 94RY for handset in cockpit.

NOTE : For connection of electrical test equipment use shielded leads only.

1 Remove safety clips and tags, and close circuit breakers: 5RY and 5RK.
2 At pedestal panel 458VU disconnect handset at electrical connector 2114VC-A.
3 Connect test box to electrical socket 2114VC and handset to test box (all switches on test box in OFF position).
4 Connect tone generator (impedance 50 Ω) to mic jacks 1.
5 Connect AC-voltmeter 1 to mic jacks 2.
6 Connect AC-voltmeter 2 to audio jacks.
7 On test box switch 'GENERATOR' and 'MIC' switch to ON.
8 On overhead panel 423 VU press pushbutton PA.
9 Adjust tone generator to 1000 Hz, 50 mV.
10 On test box set PTT switch to ON.
11 Adjust potentiometer 94RY on panel 277VU to 300 ± 30 mV indicated on AC-voltmeter 2 in audio jacks. If necessary, adjust tone generator output (50 mV) for correct voltage.
12 Disconnect test box; replace and connect handset to electrical socket 2114VC on panel 458VU.

(3)Test

(a)Perform operational test

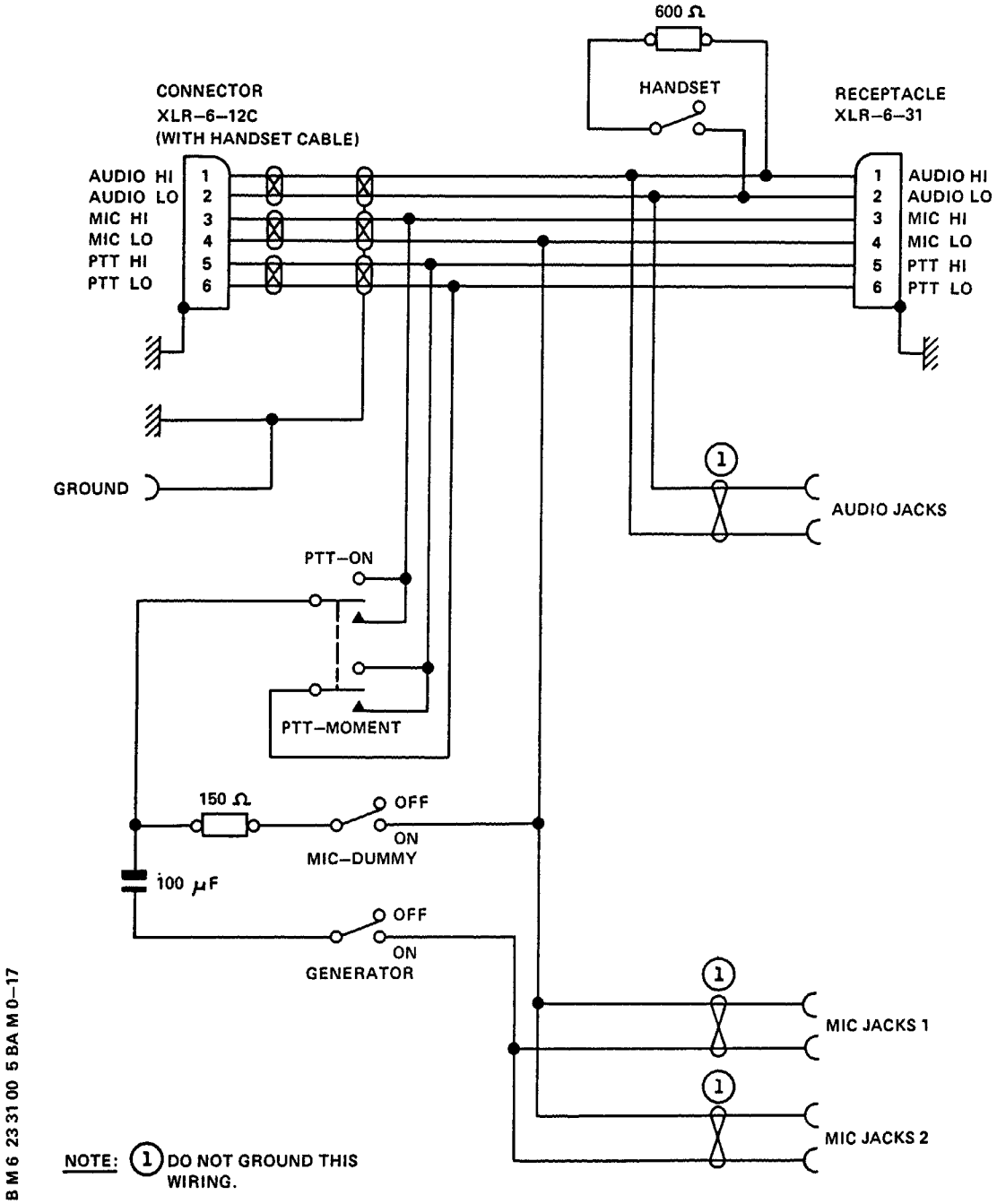
**ON A/C ALL

(Ref. Fig. 501)

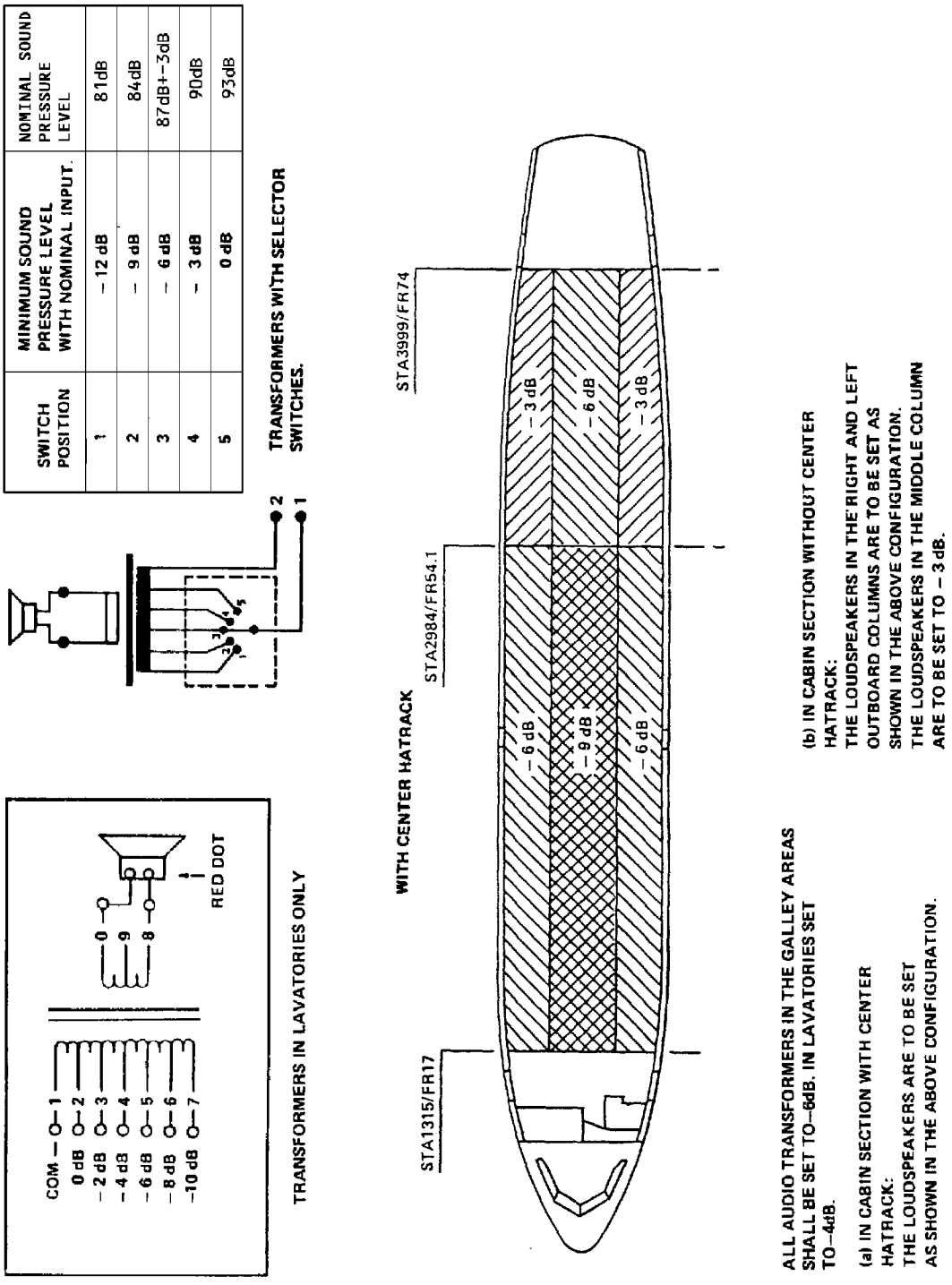
4. Adjustment of Transformers for Loudspeakers

A. Adjustment
Perform adjustment as shown on Fig. 'PA-System Loudspeaker Adjustment'.
NOTE : The adjustment is carried out prior to installation of a new loudspeaker panel.

B. Test
Perform operational test.
(Ref. Fig. 502)




Test Equipment for Sidetone Potentiometer
Figure 501


SWITCH POSITION
MINIMUM SOUND PRESSURE LEVEL WITH NOMINAL INPUT.
NOMINAL SOUND PRESSURE LEVEL
1 – 12 dB 81dB
2 – 9 dB 84dB
3 – 6 dB 87dB+-3dB
4 – 3 dB 90dB
5 0 dB 93dB
TRANSFORMERS WITH SELECTOR SWITCHES.
2
1
COM
0 dB
– 2 dB
– 4 dB
– 6 dB
– 8 dB
–10 dB
RED DOT
TRANSFORMERS IN LAVATORIES ONLY
WITH CENTER HATRACK
STA3999/FR74
STA2984/FR54.1
STA1315/FR17
– 3 dB
– 6 dB
– 3 dB
– 6 dB
– 9 dB
– 6 dB
NOTE: ALL AUDIO TRANSFORMERS IN THE GALLEY AREAS SHALL BE SET TO –6dB. IN LAVATORIES SET TO –4dB.
(a) IN CABIN SECTION WITH CENTER HATRACK:
THE LOUDSPEAKERS ARE TO BE SET AS SHOWN IN THE ABOVE CONFIGURATION.
(b) IN CABIN SECTION WITHOUT CENTER HATRACK:
THE LOUDSPEAKERS IN THE RIGHT AND LEFT OUTBOARD COLUMNS ARE TO BE SET AS SHOWN IN THE ABOVE CONFIGURATION.
THE LOUDSPEAKERS IN THE MIDDLE COLUMN ARE TO BE SET TO – 3dB.

BM6 23 31 00 5 BBM0 01

PA - System Loudspeaker Adjustment
Figure 502

5. Measurement of the PA-Sound Level

A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Sound Pressure Meter,<br>range 90 - 130 dB (A),<br>accuracy +/- 1dB |
| (2) | Test Tone Generator,<br>output 1000 Hz, 0 db |

B. Put the handset from the purser station located at door 1 to the test tone generator.

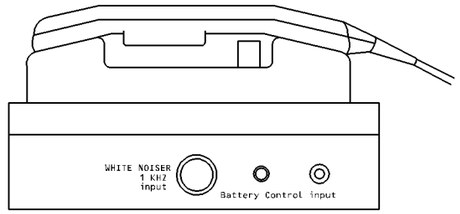
C. Test Procedure (Ref. Fig. 503)

| ACTION | RESULT |
|---|---|
| 1. On the test tone generator:<br>- select the 1000 Hz tone. | In the cabin, in all lavatories and at all attendant stations:<br>- the test tone is heard from all loudspeakers. |
| 2. At the sound pressure meter:<br>- select the range 80 - 130 dB and put the sound pressure meter in position approx 10 cm +/- 0,5 cm below the first loudspeaker. | At the sound pressure meter display:<br>- The value on the display must be within the value as given in the figure "PA-Sound Pressure Level". |

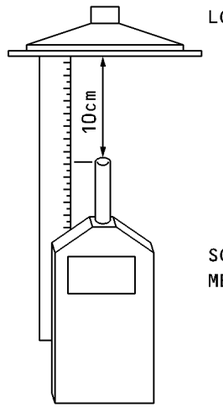
NOTE : If necessary adjust the sound pressure level with the transformer selector switch.

D. Repeat the test procedure for all loudspeakers.

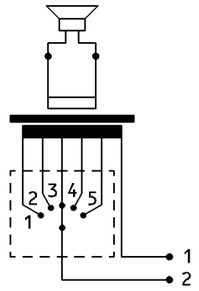
E. Switch off and disconnect the test tone generator; put the handset to the purser station.




TEST TONE INPUT VIA TEST UNIT



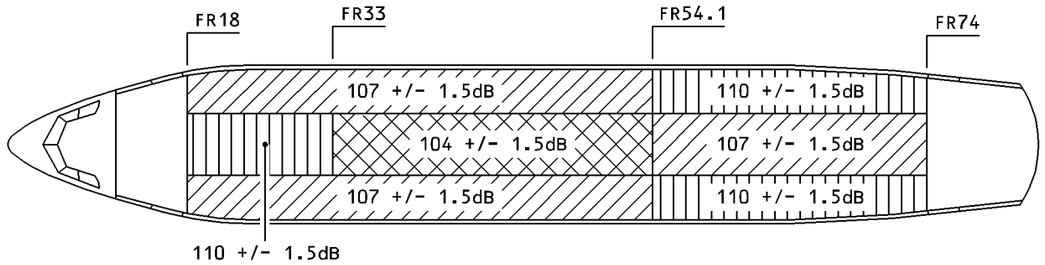

MEASUREMENT OF SOUND PRESSURE LEVEL



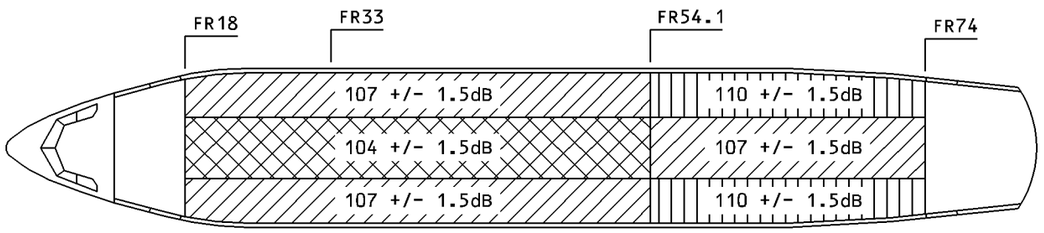

| SWITCH POSITION | SOUND PRESSURE LEVEL AT 0.1M DISTANCE |
|---|---|
| 1 | 101dB |
| 2 | 104dB |
| 3 | 107dB |
| 4 | 110dB |
| 5 | 113dB |

TRANSFORMER WITH SELECTOR SWITCH

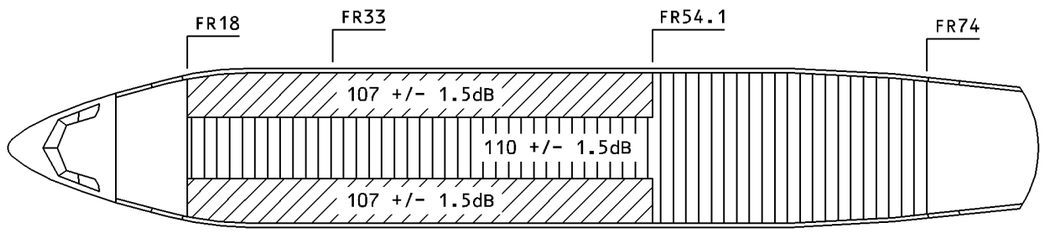
CONFIGURATION B
WITH CENTER HATRACK Y/C
WITHOUT CENTER HATRACK F/C
(HIGH CEILING)




CONFIGURATION A
WITH CENTER HATRACK F/C AND Y/C




CONFIGURATION C
WITHOUT CENTER HATRACK F/C AND Y/C
(HIGH CEILING)




PA-Sound Pressure level
Figure 503

BM6 23 31 00 5 BBTO 00

# PASSENGER ADDRESS AMPLIFIER - REMOVAL/INSTALLATION

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| | Circuit Breaker Safety Clips |
| Referenced Procedure<br>- 23-31-00, P. Block 501 | Passenger Address Amplifier System |

## 2. Procedure

(Ref. Fig. 401)

A. Job Set-Up

(1)Open, safety and tag the following circuit breaker :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | COM/PASSENGER ADDRESS | 5RY | 208/B15 |

(2)Unlock Dzus fasteners and remove shelf 96VU protective panel.

B. Removal

(1)Loosen locknut (3) until stud (4) is released.
(2)Pull out amplifier (6) from mounting (5).

C. Installation

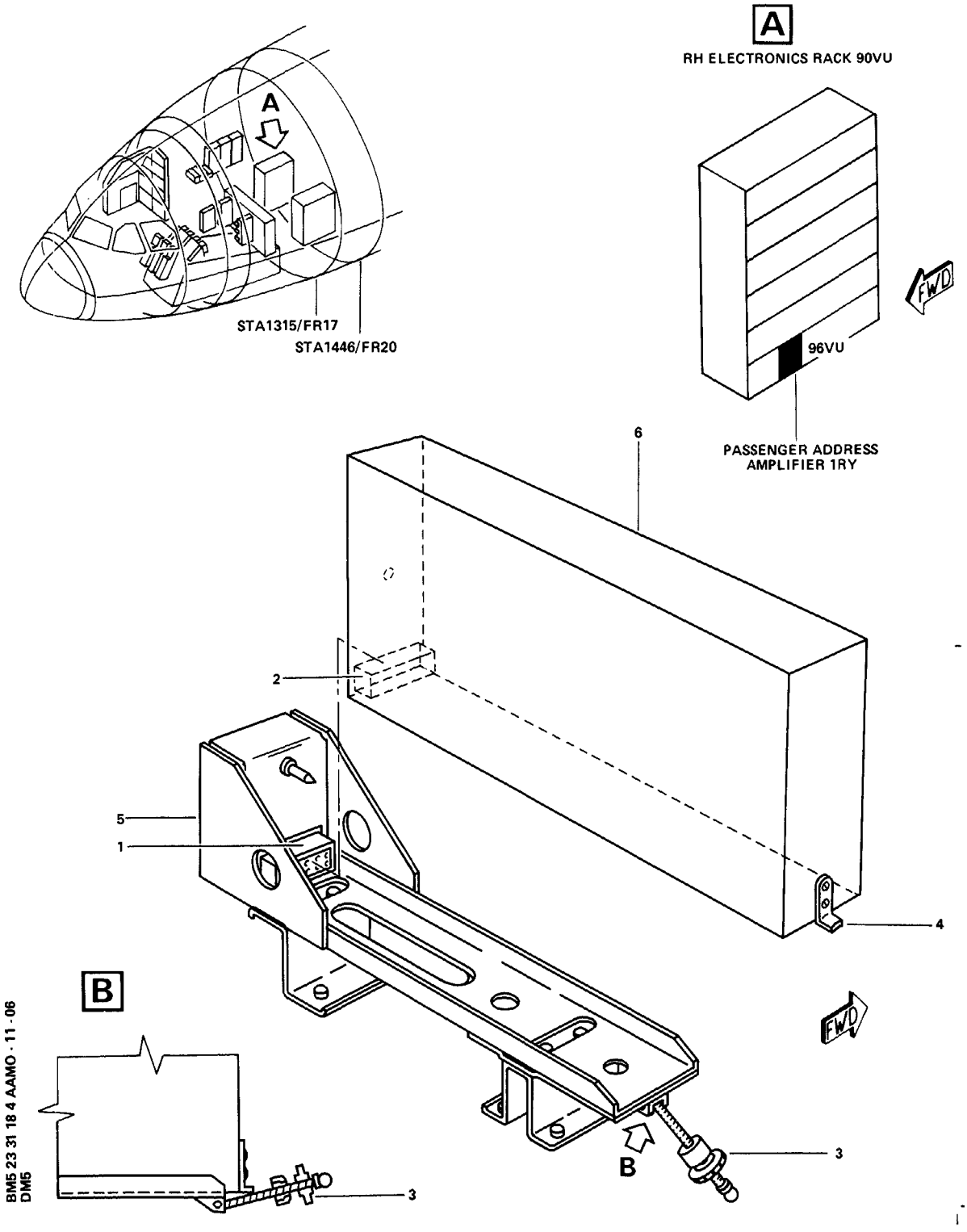
(1)Clean and inspect amplifier interface.
(2)Make certain that electrical connectors are in correct condition.
(3)Push in amplifier on mounting and make certain that connector (1) is fully engaged in connector (2).
(4)Tighten locknut (3) on stud (4).
(5)Remove safety clip and tag and close circuit breaker 5RY

D. Tests

Carry out operational test of passenger address system (Ref. 23-31-00, P. Block 501).

E. Close-Up

(1)Install protective cover on shelf 96VU and attach with Dzus fasteners.
(2)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.




Passenger Address Amplifier
Figure 401

# PASSENGER COMPARTMENT LOUDSPEAKERS - REMOVAL/INSTALLATION

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |

Referenced Procedures

| | |
|---|---|
| - 21-21-00, P. Block 501 | Flight Compartment and Electronic Racks Air Distribution |
| - 23-31-00, P. Block 501 | Passenger Address System |
| - 24-41-00, P. Block 301 | AC External Power Control |

## 2. Procedure

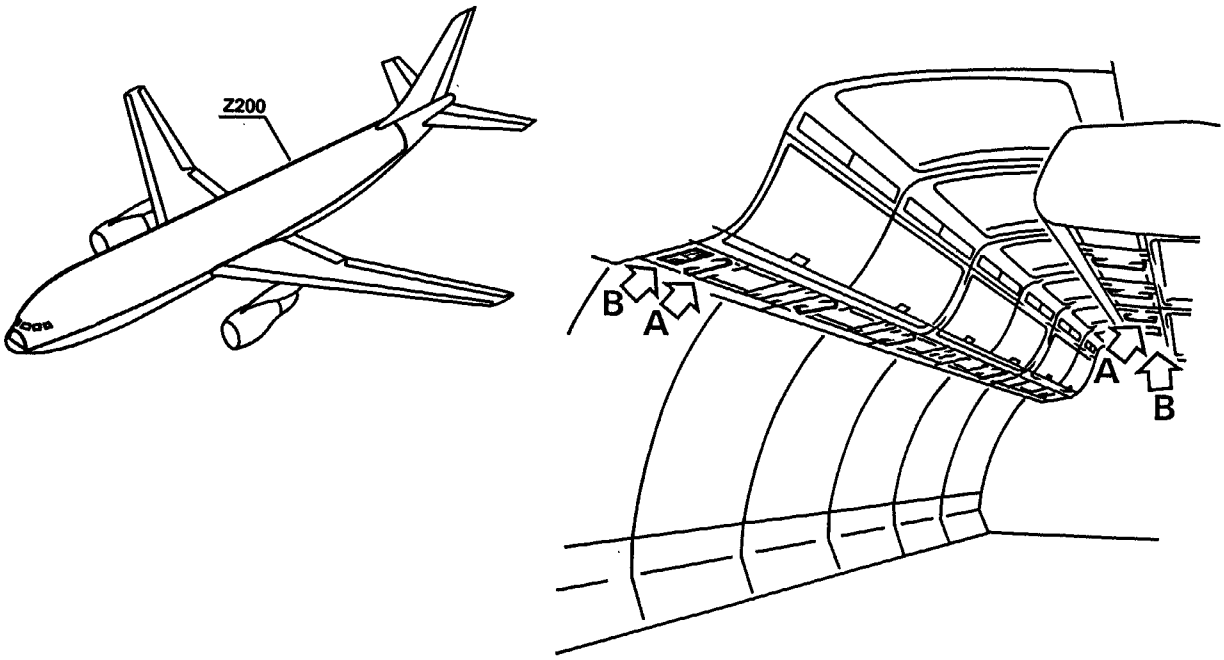
A. Job Set-Up
(1)Open, safety and tag the following circuit breaker:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| R 21VU | COM PASSENGER ADDRESS | 5RY | B15 |

B. Removal
(1)Remove mounting seal (1) and lower panel (3).
(2)Disconnect loudspeakers cables (8).
(3)Remove nuts (6), washers (5) and screws (2).
(4)Release spring clips (4) and remove loudspeaker (7).
NOTE : Before removing loudspeaker note transformer settings for subsequent installation (Ref. 23-31-00, P. Block 501).
(Ref. Fig. 401)

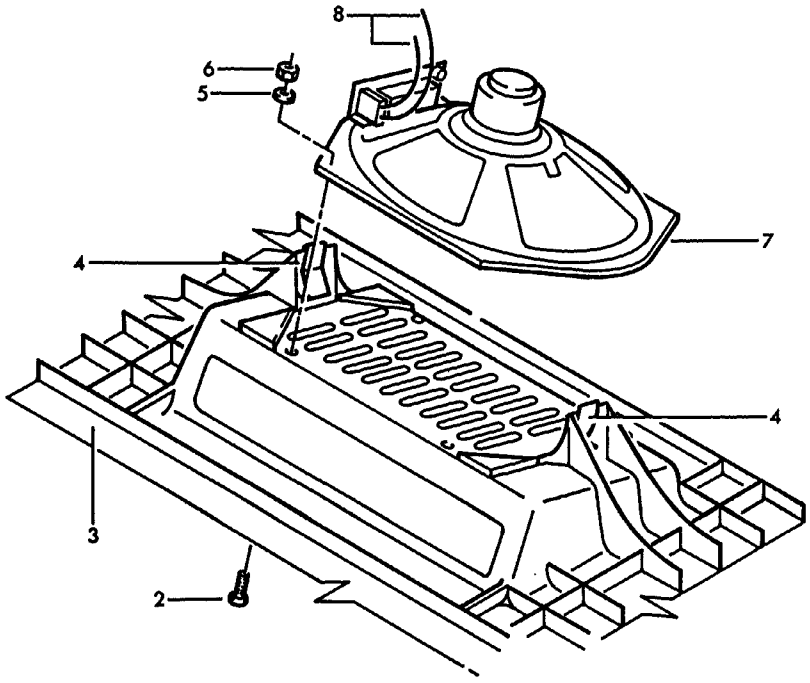
C. Installation
(1)Install loudspeaker (7) using spring clips (4).
NOTE : Make certain that transformer settings are as noted during removal (Ref. 23-31-00, P. Block 501).
(2)Install screws (2), washers (5) and nuts (6).
(3)Connect loudspeaker cables (8).
(4)Close panel (3) and secure with mounting seal (1).

D. Test
(1)Job Set-Up
(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronic racks air distribution system is operating (Ref. 21-21-00, P. Block 501).
(c)Remove safety clip and tag and close circuit breakers 5RY.
(2)Test

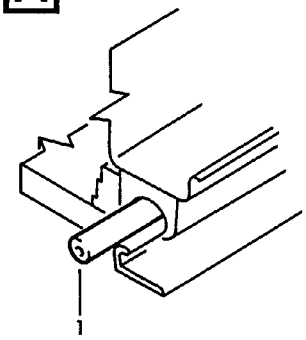



B

TYPICAL LOUDSPEAKER REMOVAL




A




BM6 23 31 25 4 AAMO 00

Passenger Compartment Loudspeakers.
Figure 401

| ACTION | RESULT |
|---|---|
| At electronic rack, panel 96VU (95VU):<br>- place test switch on front of PA<br>R amplifier 1RY to TONE<br>position (detent position). | In passenger compartment:<br>- test signal is broadcast at speakers in passenger compartment. |
| At electronic rack, panel 96VU (95VU):<br>- place test switch on front of PA<br>R amplifier 1RY to OPERATION<br>position (detent position). | In passenger compartment:<br>- test signal at speakers in passenger compartment stops. |

E. Close-Up

(1)Make certain that the working area is clean and free of tools and miscellaneous items of equipment.

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |

Referenced Procedures

| | |
|---|---|
| - 21-21-00, P. Block 501 | Flight Compartment and Electronic Racks Air Distribution |
| - 24-41-00, P. Block 301 | AC External Power Control |

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breaker:

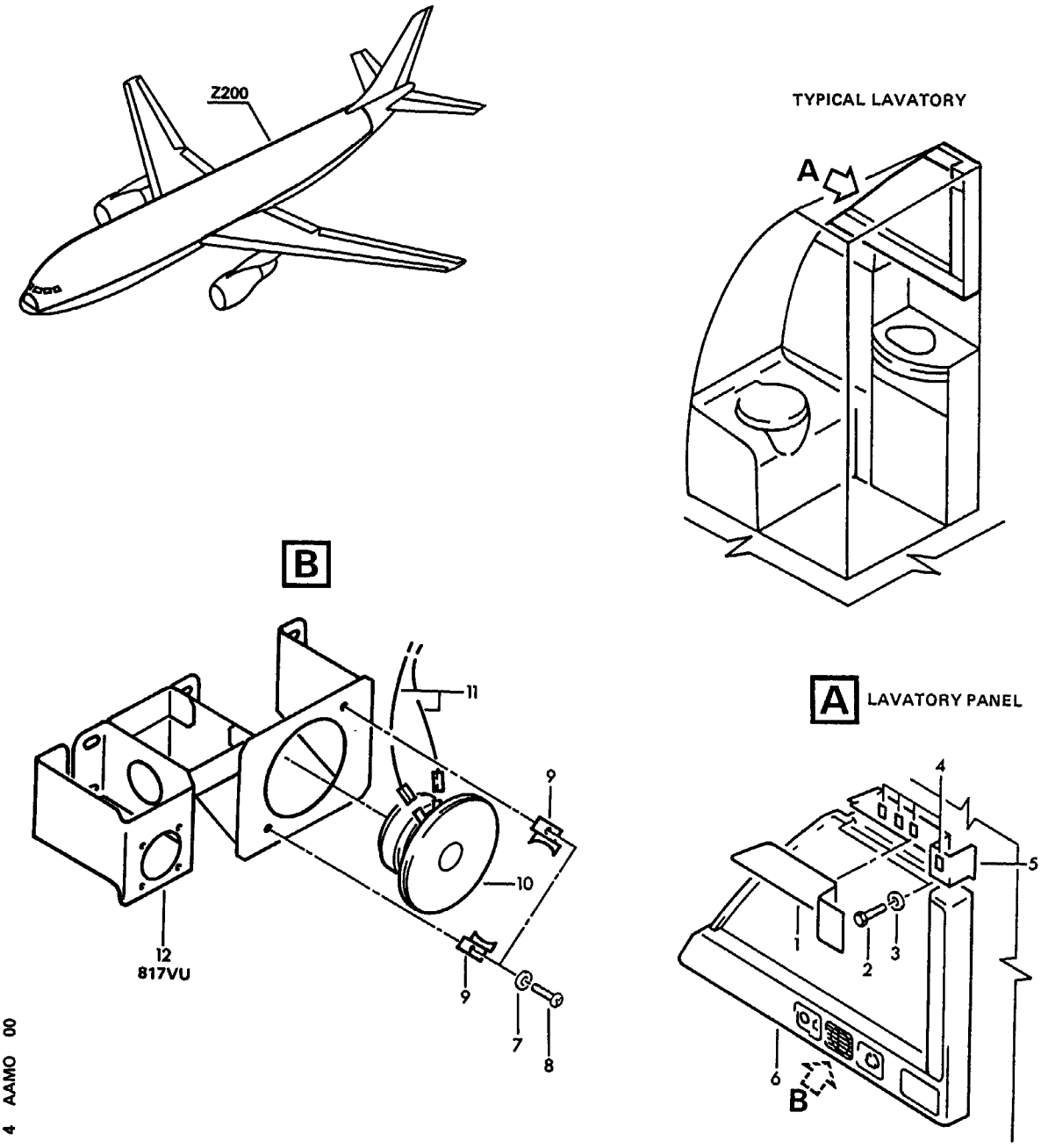
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | COM PASSENGER ADDRESS | 5RY | B15 |

B. Removal
(1)Pull cover (1) free from bracket (5).
(2)Remove screws (2) and washers (3).
(3)Lower lavatory panel (6).
(4)Disconnect loudspeaker cables (11).
(5)Remove screws (8) and washers (7).
(6)Remove spring clips (9) and loudspeaker (10).

(Ref. Fig. 401)

C. Installation
(1)Position loudspeaker (10) and install spring clips (9).
(2)Install washers (7) and screws (8).
(3)Connect loudspeaker cables (11).
(4)Pull lavatory panel (6) into the upright position.
(5)Install washers (3) and screws (2).
(6)Install cover (1) onto bracket (5) ensuring velcro strips (4) make good contact.

D. Test
(1)Job Set-Up
(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make sure that electronics rack air distribution system is operating (Ref. 21-21-00, P. Block 501).
R (c)Remove safety clip and tag and close circuit breaker 5RY.
(2)Test




BM6 23 31 26 4 AAMO 00

Lavatory Loudspeakers.
Figure 401

| ACTION | RESULT |
|---|---|
| At electronics rack, panel 96VU (95VU):<br>- place test switch on front of PA<br>R amplifier 1RY to TONE<br>position (detent position).<br>- place test switch on front of PA<br>R amplifier 1RY to OPERATION<br>position (detent position). | In passenger compartment:<br>- test signal is broadcast at speakers in passenger compartment.<br>- test signal at speakers in passenger compartment stops. |

E. Close-Up

(1)Make sure that the working area is clean and free of tools and miscellaneous items of equipment.

# ANNOUNCEMENT - MUSIC TAPE REPRODUCER SYSTEM
## DESCRIPTION AND OPERATION

1. General

The combined announcements and music tape system is designed to automatically provide prerecorded announcements and music programs. The system announcement reproducer is controlled by an attendant control unit and the system audio output is broadcast through the aircraft passenger address system.

2. Component Location

R **ON A/C 001-100,

(Ref. Fig. 001)

R **ON A/C 101-200,

R (Ref. Fig. 002)

R **ON A/C 001-100,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 7RX | ATTENDANT CONTROL UNIT - TAPE REPRODUCER | | 221 | | |
| 9RX | ANNOUNCEMENT REPRODUCER | 82VU | 122 | 121BL | |
| 19WR | RELAY - OXYGEN MASK RELEASE | 282VU | 122 | 121BL | |

R **ON A/C 101-200,

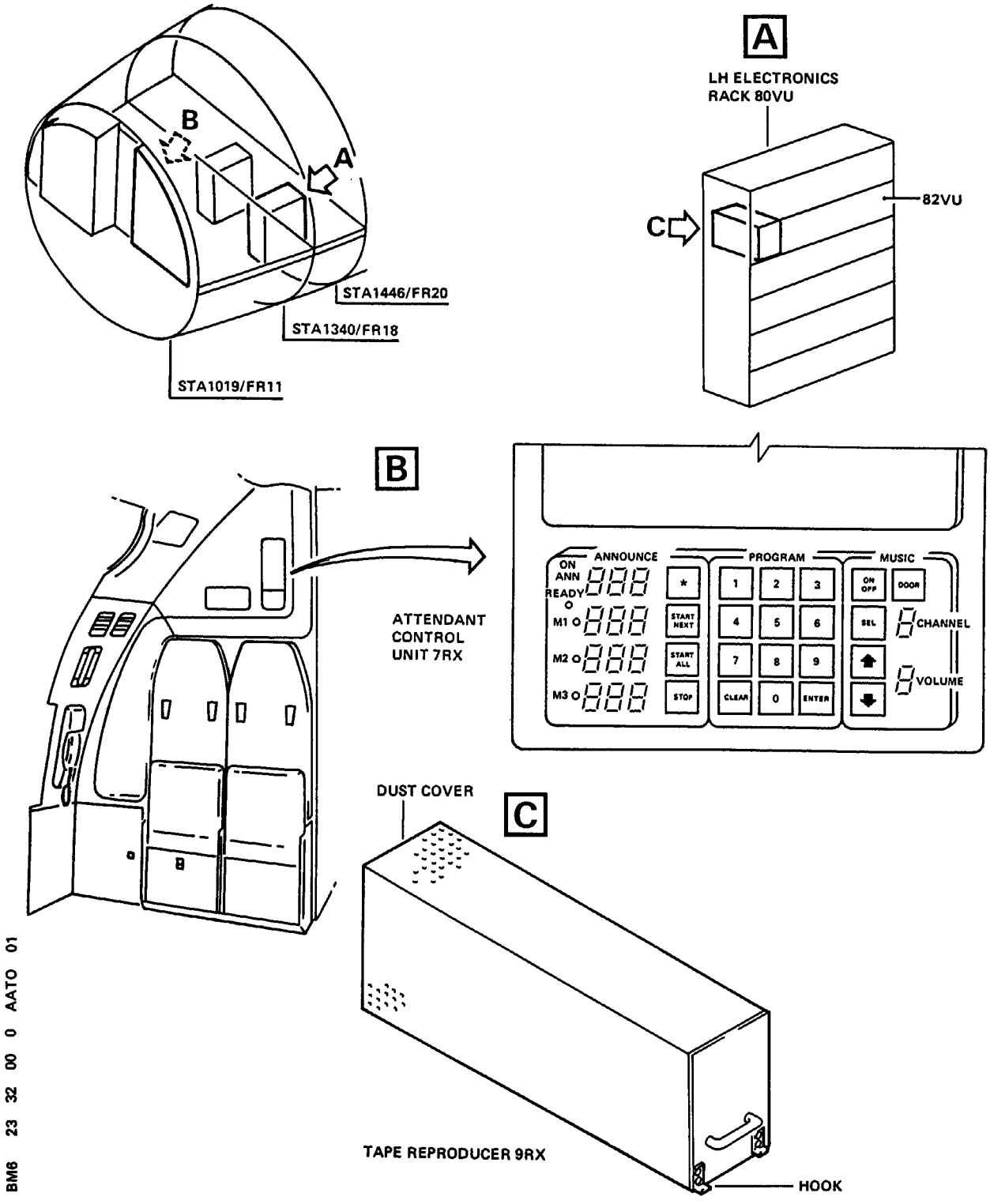
| R FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| R 7RX | ATTENDANT CONTROL UNIT - TAPE REPRODUCER | | 221 | | |
| R 9RX | ANNOUNCEMENT REPRODUCER | 82VU | 122 | 121BL | |
| R 19WR | RELAY - OXYGEN MASK RELEASE | 282VU | 122 | 121BL | |
| R 16RX | DIODE | 107VU | 122 | | |
| R 17RX | DIODE | 107VU | 122 | | |

3. System Description

A. Principle

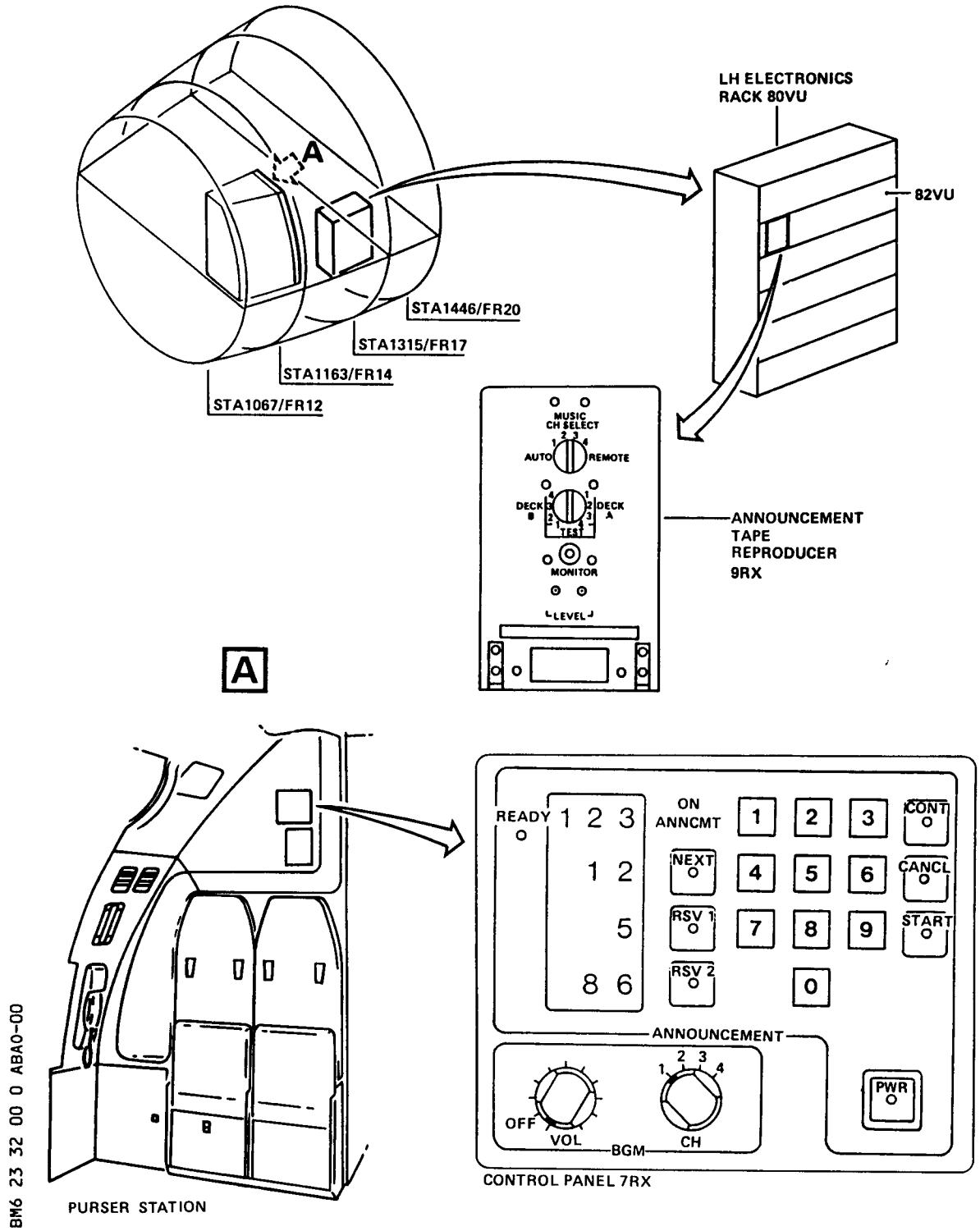
(1) The tape reproducer is loaded with four magnetic tape cassettes. Two cassettes are prerecorded with several announcements and two cassettes with music programs for Boarding Music (BGM).

(2) Any of the announcements can be keyed-in on the remote control unit and played back over the passenger address and passenger entertainment systems. In the event of cabin depressurization, an emergency announcement is automatically played back. These announcements have priority and will override the passenger entertainment music, video sound and




BM6 23 32 00 0 AATO 01

Announcement - Music Tape Reproducer System
Component Location
Figure 001




Announcement - Music Tape Reproducer System
Component Location
Figure 002

boarding music.

(3)The BGM is stored on a 4-track tape pair. Each track may be separately selected or allowed to play through automatically in sequence, as required. The BGM tape is selected from the remote control unit at the purser's station and played back over the passenger address system. The output has the lowest priority in the tape reproducer priority selection control circuit.

(4)A potentiometer, on the remote control panel, provides volume control of the tape reproducer BGM audio output.

R **ON A/C 001-100,

3. System Description

A. Principle

(1)Factory installed EPROM Memory chips in the announcement reproducer provide the announcements. Any of the announcements can be keyed-in on the remote control unit and played back over the passenger address and passenger entertainment systems. In the event of cabin de-pressurization at high altitude, an emergency announcement is automatically played back. These announcements have priority and will override the passenger entertainment music and boarding music.

(2)The attendant control unit is loaded with one magnetic tape cassette which contains prerecorded music programs for the BGM. Two spare cassettes can also be inserted into the unit. The panel is divided into three sections, the announcement, program and music sections.

B. System Architecture

(1)The system interfaces directly with the following systems:

- Passenger Address (RY)
- Passenger Oxygen (WR)
- Passenger Entertainment-video (MM) (if fitted)
- Passenger Entertainment-music (MK) (if fitted)

(2)When an announcement is initiated, the audio output from the tape reproducer is applied to the passenger address (PA) system amplifiers to drive the PA loudspeakers, broadcasting the announcement throughout the passenger compartment and to provide an output to the passenger entertainment system (PES).

In the event of cabin depressurization, activation of the passenger oxygen system starts the announcement reproducer. The emergency announcement is automatically broadcast and overrides all other prerecorded announcements, the passenger entertainment and boarding music. The audio output from the video system is applied to the PA amplifiers via relay 133MM. When an announcement is initiated, the relay is energized and its contacts change over to break the video lines and feed the tape reproducer output to the PA amplifier.

R **ON A/C 101-200,

R B. System Architecture

R (1)The system interfaces directly with the following systems:
R - Passenger Address (RY)
R - Passenger Oxygen (WR)
R - Passenger Entertainment-music (MK)
R (2)When an announcement is initiated, the audio output from the tape reproducer is applied to the passenger address (PA) system amplifiers to drive the PA loudspeakers, broadcasting the announcement throughout the passenger compartment and to provide an output to the passenger entertainment system (PES).
R In the event of cabin depressurization, activation of the passenger oxygen system starts the announcement reproducer. The emergency announcement is automatically broadcast and overrides all other prerecorded announcements, the passenger entertainment and boarding music.

R **ON A/C 001-100,

(Ref. Fig. 003)

R **ON A/C 101-200,

(Ref. Fig. 004)

R **ON A/C 001-100,

C. System Power Supply
The tape reproducer is supplied with 28V DC from the normal busbar 110PP via circuit breaker 1RX. The control unit is supplied with 28V DC from the announcement reproducer. 28V DC from busbar 110PP via circuit breaker 1RX is also used to power relay 133MM when an announcement is keyed.

R **ON A/C 101-200,

C. System Power Supply
The tape reproducer is supplied with 115V AC from the normal busbar 105XP-B via circuit breaker 2RX.

R **ON A/C 001-100,

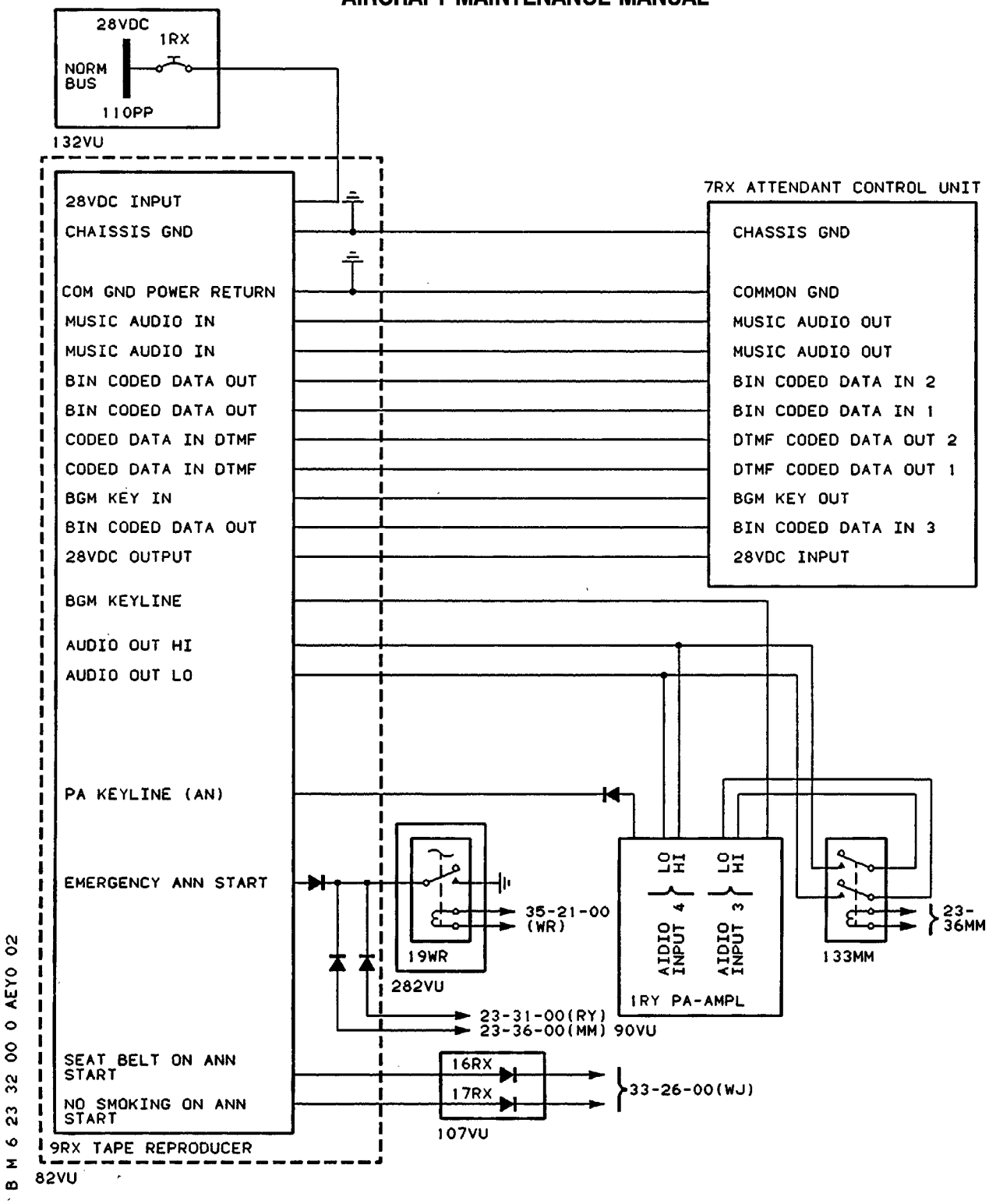
(Ref. Fig. 005)

R **ON A/C 101-200,

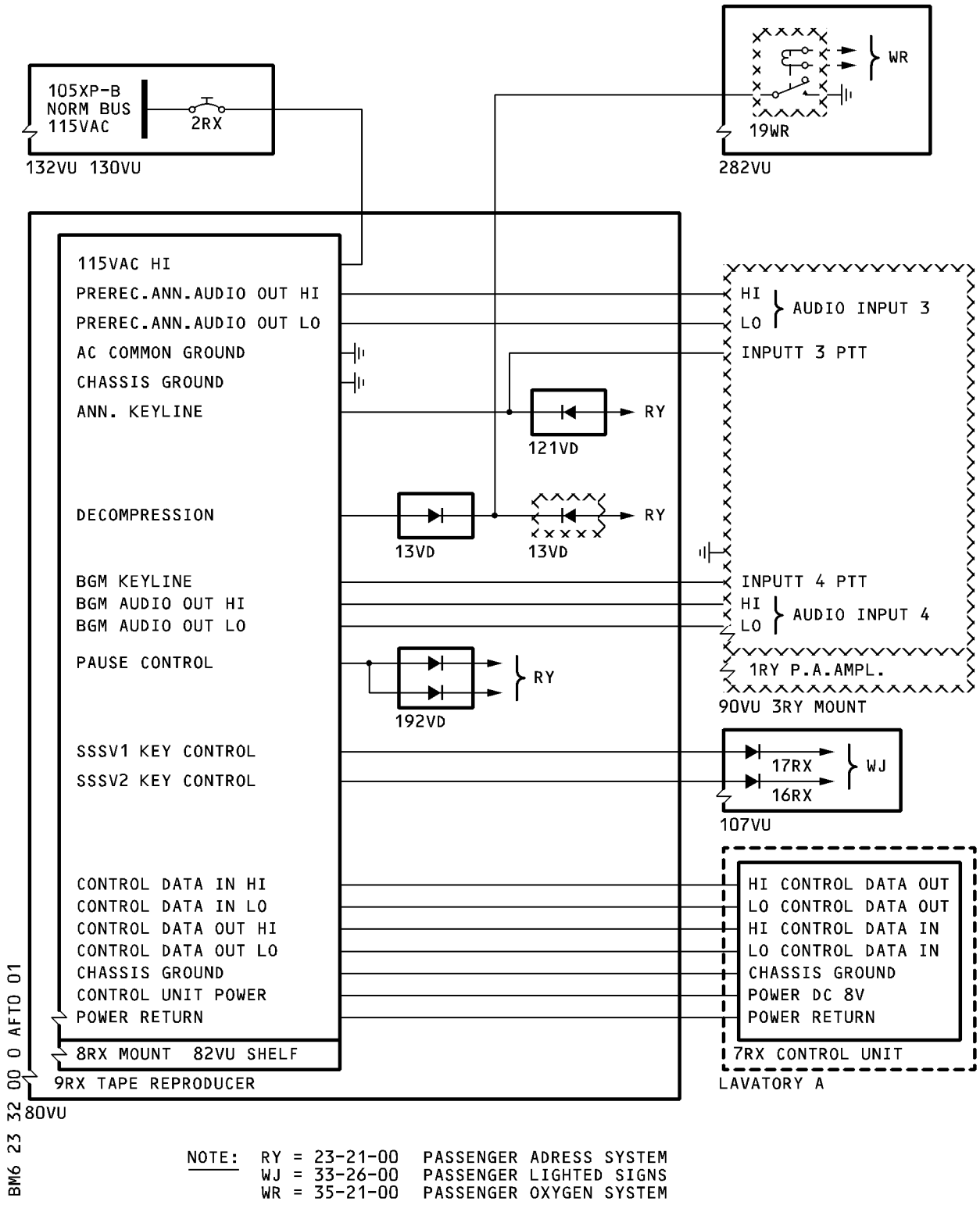
(Ref. Fig. 006)

4. Component Description

A. Tape Reproducer
(1)Description
The tape reproducer is to play back up to 126 announcements as



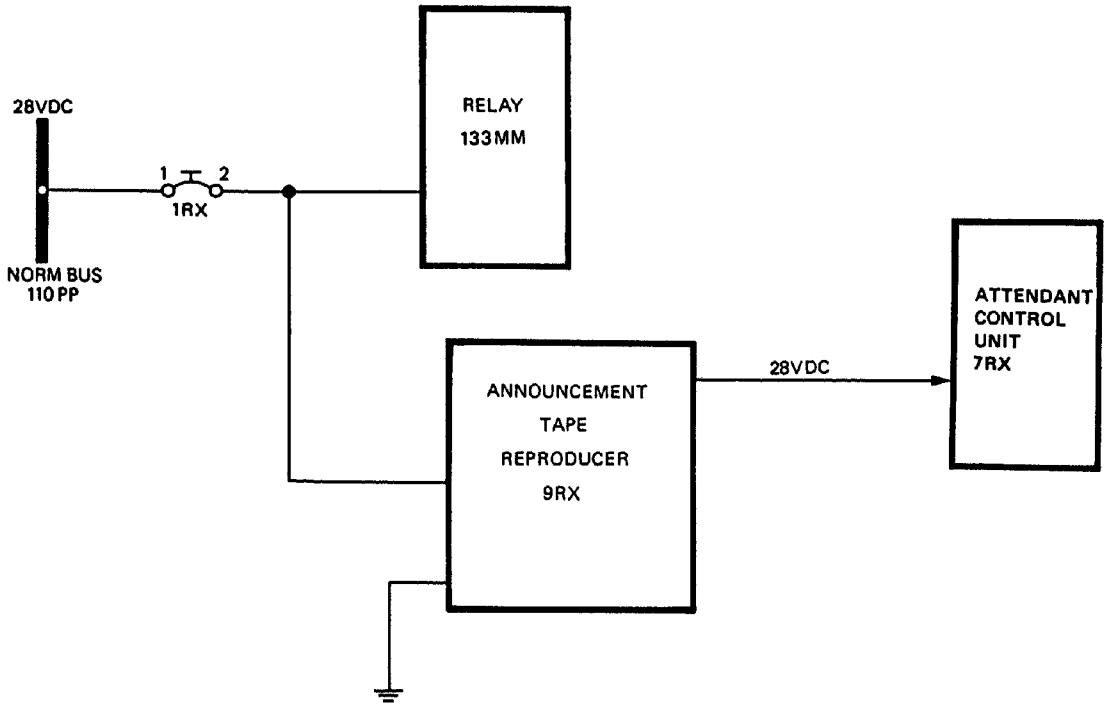

Announcement - Music Tape Reproducer System
Schematic Diagram
Figure 003




NOTE: RY = 23-21-00 PASSENGER ADRESS SYSTEM
WJ = 33-26-00 PASSENGER LIGHTED SIGNS
WR = 35-21-00 PASSENGER OXYGEN SYSTEM

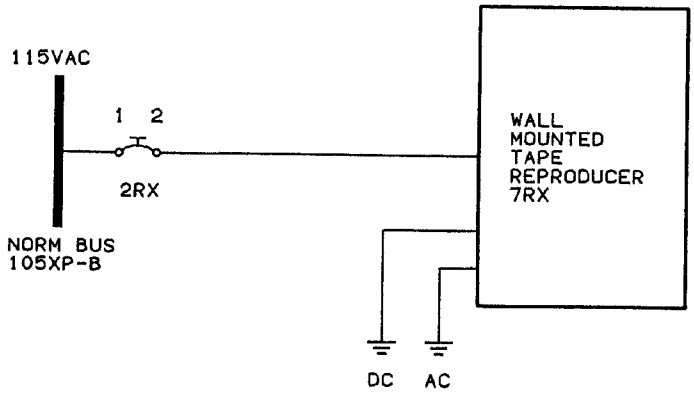
BM6 23 32 00 0 AFTO 01

Announcement - Music Tape Reproducer System
Schematic Diagram
Figure 004




BM6 23 32 00 0 AJPO 00

Announcement - Music Tape Reproducer System
Power Supply
Figure 005




B M 6 23 32 00 0 AJR0 00

Announcement - Music Tape Reproducer System
Power Supply
Figure 006

well as boarding music from cassette tapes. Two pairs of tape deck assemblies are used, one pair for the announcements and the other for the boarding music.

The announcement section consists of the following main assemblies

- two electrically controlled tape deck assemblies. Each assembly is fitted with a special 4-channel reproducing head, brushless capstan and reel motors to drive the tape, two solenoids **A** and **B** for positioning the head plates in the required positions, photo-electric sensors for reel rotation detection and a motor control and head amplifier assembly. The capstan motor moves the tape in one direction only for playback while the reel motor drives the take-up reel during playback and rewinds the tape.
- a tape reproducer circuit card assembly. This assembly contains the microcomputerized control logic circuits for the tape deck assemblies, audio amplifier circuits for the announcement and monitor outputs, an announcement selection logic circuit and a power supply circuit. This card is also equipped with a **D**ual **I**n-line **P**ackage **(DIP)** switch to enable the selection of the number of times that the emergency announcement is played back.
- an interface card assembly which interfaces the tape deck assemblies with the tape reproducer circuit card assembly. This assembly also provides track output selection, signal conditioning and control data buffers.

The front face of the reproducer contains:

- a multiposition rotary switch and a headset socket jack for monitoring the announcements recorded on each track of tapes fitted in the two tape decks **A** and **B**.
- normal and emergency announcement output level adjustment potentiometers.
- a multiposition rotary switch used in conjunction with the headset jack to monitor the boarding music output.

Hinged doors on each side of the tape reproducer provide access to the tape decks for loading/removing the cassettes.

The **B**oarding **M**usic **(BGM)** section consists of the following main assemblies:

- two electronically controlled tape deck assemblies. Each assembly is fitted with a special 4-channel reproducing head, brushless capstan and reel motors to drive the tape, two solenoids **A** and **B** for positioning the head plates in the required positions, photo-electric sensor for reel rotation detection and a motor control and head amplifier assembly. The capstan motor moves the tape in one direction only for playback while the reel motor drives the take-up reel during playback and rewinds the tape.
- a tape reproducer circuit card assembly. This assembly contains the microcomputerized control logic circuits for the tape deck assemblies, audio amplifier circuits for the **BGM** and monitor outputs, a **BGM** selection logic circuit and a power supply circuit.

The front face of the reproducer contains:

- a multiposition rotary switch to select one of four music channels, to switch in **REMOTE** position or to switch in **AUTO** position.

Hinged doors on each side of the tape reproducer provide access to the

tape decks for loading/removing the cassettes.
The music tape decks are loaded with a pair of prerecorded music cassette tapes. These tapes are provided with four channels. Playback is possible in one direction only. The music tapes are labeled: **MUSIC A** and **MUSIC B**. Tape **A** contains the first half of four mono programs, and tape **B** the other half of mono programs. The four **BGM** channels are prerecorded in sequence and will be played back continuously when **MUSIC CH SELECT** switch on the front panel of the tape reproducer is in **AUTO** position. A control logic automatically selects the four channels in turn, in an endless sequence beginning with channel No. 1. When one tape is playing the other one will be automatically rewound.

R **ON A/C 001-100,

4. Component Description

A. Announcement Reproducer (AR)
(1)Description
The announcement reproducer plays back emergency and up to 14 announcements from **EPROM** memory chips.
The **EPROM** Memory chips are programmed at the factory before they are installed in the **AR** unit. Selection of the announcements is controlled from the attendant control panel and from switch closure to aircraft chassis ground.
In addition the unit is equipped with three separate announcements prerecorded on Erasable Program Memory **(EPROM)** chips. They are used for automatic announcements.

R **ON A/C 101-200,

(2)Operation
The different operating modes of the tape reproducer are as follows:
- Play
  Solenoid **A** is energized to position the tape deck reproducing head on the tape. At the same time the capstan and reel motors drive the tape and the announcement is played back.
- Search
  This mode is similar to the play mode and is used to search for the selected announcement. Announcements are recorded on the tape in slots. Each slot is preceded by a blank position which contains the slot address code. This address code is used by the control unit to select an announcement. Tracks 1 and 2 of the tape are used for recording normal announcements starting from slot 1 to slot 63 on each track. Two or more slots may be used to record an announcement. Track 3 contains a number of identical emergency announcements. Track 4 contains 70 Hz cue signals which are used in conjunction with the slot address code to find a selected announcement.
- Fast Forward
  Solenoids **A** and **B** are both energized in this mode, to place the reproducing head in the fast forward/rewind position. Solenoid **B** remains

energized after this position is reached and holds the head in position while the reel motor drives the tape rapidly forwards. This mode ends when the designated slot position on the tape just passes the head. The slot position is detected by counting the cue signals on track 4 of the tape. This mode is always followed by the rewind mode.

- Rewind
  As in the fast forward mode, Solenoids A and B place the reproducing head in the rewind/fast forward position. Solenoid B then holds the head in position while the reel motor rewinds the tape rapidly. This mode ends when the start position of the designated slot on the tape just passes the head or when the reel rotation stop is detected.
- Electric Brake
  This happens during the transition from the fast forward to rewind mode or vice-versa. The motor is electrodynamically stopped.
- Stop
  During the transition from rewind to search, solenoid B is de-energized to place the head in the rest position and to apply a mechanical brake to the tape deck reels in readiness for the search mode.
- Standby
  This is an extended stop mode which occurs after the search and play modes.

R **ON A/C 001-100,

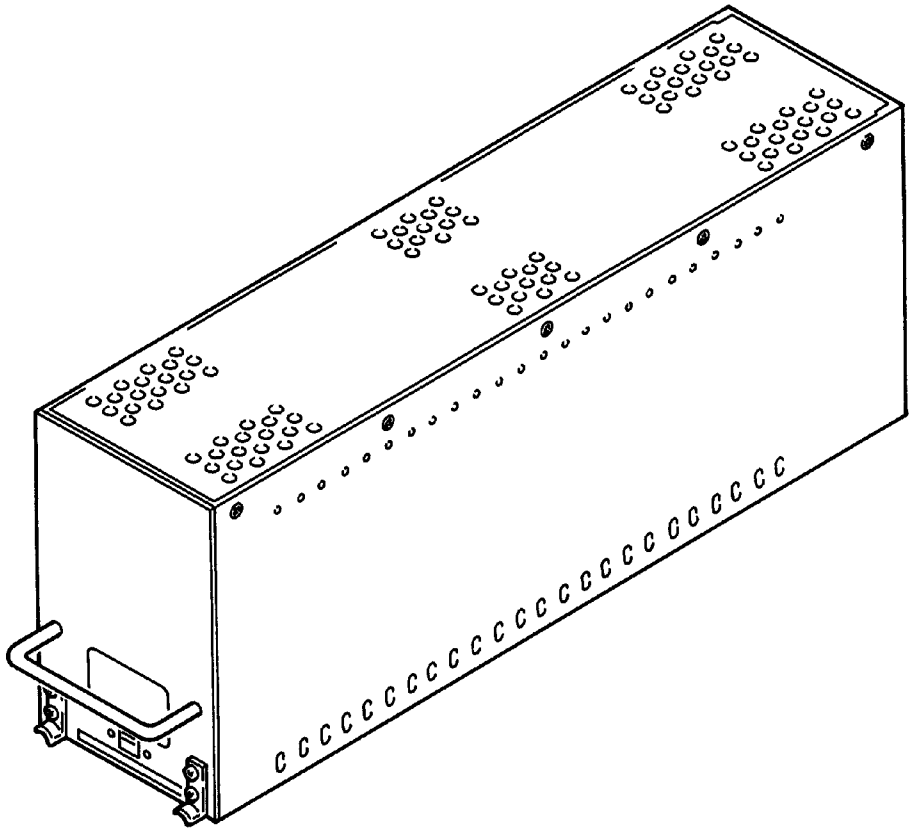
(Ref. Fig. 007)

R **ON A/C 101-200,

(Ref. Fig. 008)
(Ref. Fig. 009)
(Ref. Fig. 010)
(Ref. Fig. 011)

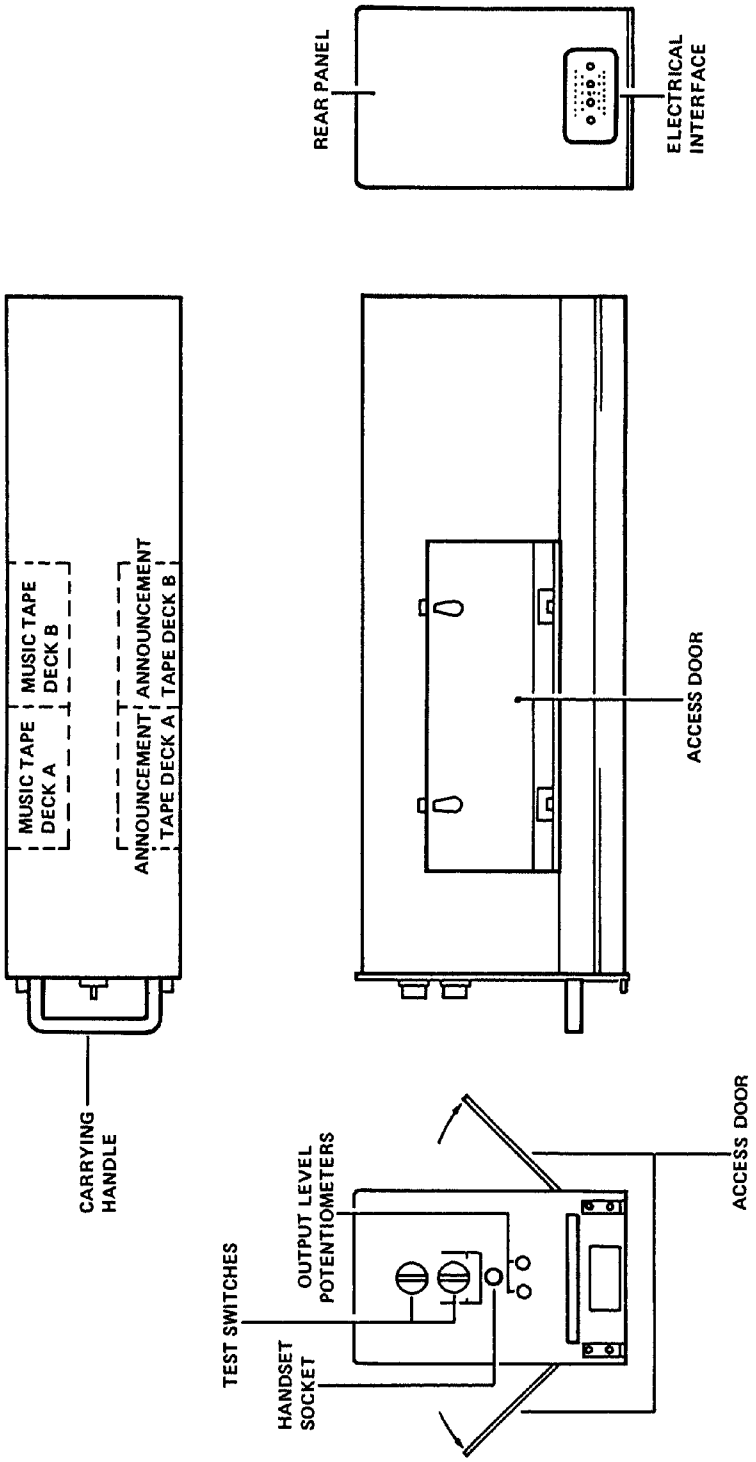
R **ON A/C 001-100,

B. Attendant Control Unit (ACU)
The ACU consists of a control panel, a tape reproducer for Boarding Music (BGM) and a holder for two spare cassettes. The tape is fitted with a special 4-channel reproducing head, brushless capstan and reel motors to drive the tape. A metal tape guide is attached to each side of the play-back head, ensuring close vertical alignment of the tape.
Four microprocessor controlled motors to drive the cassette modules. One brushless capstan motor, two brushless reel motors and one mechanism-driving motor.
The brushless capstan motor drives the tape at a constant speed, the two reel motors are for the FFW and RW positions and the mechanism-driving motor provides the direction control, head engagement and pinch roller engagement. Dual capstans, one for each direction, are used to pull the tape over the magnetic head.
The control unit consists of three sections:



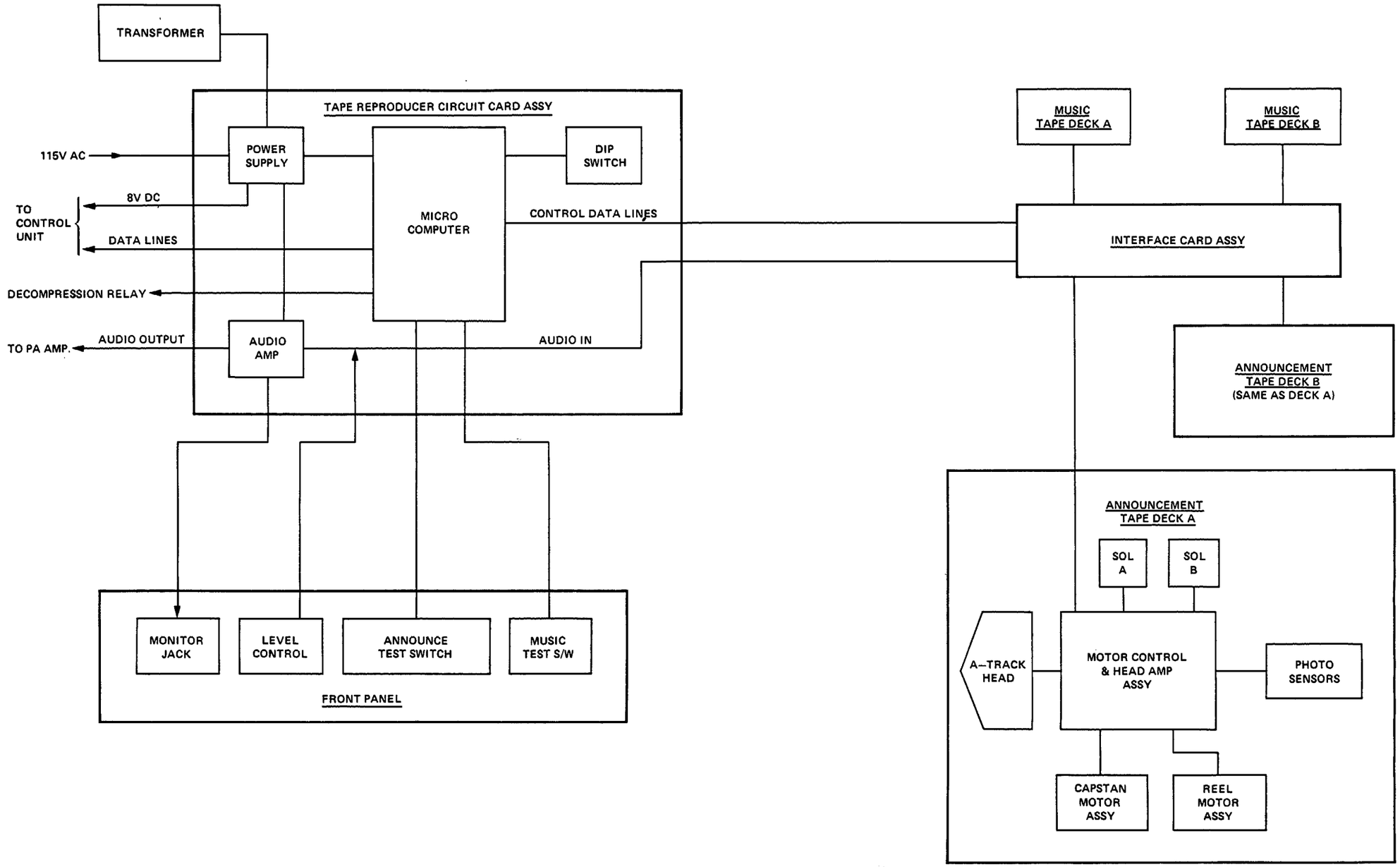
BM6 23 32 00 0 ALBO 00

Announcement Reproducer
Figure 007



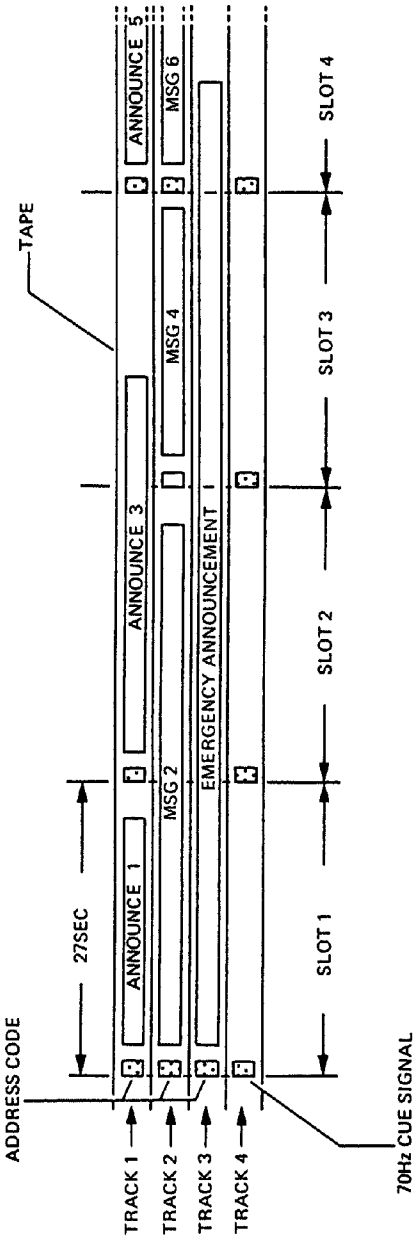

BM6 23 32 00 0 ALCO 00

Tape Reproducer
Figure 008



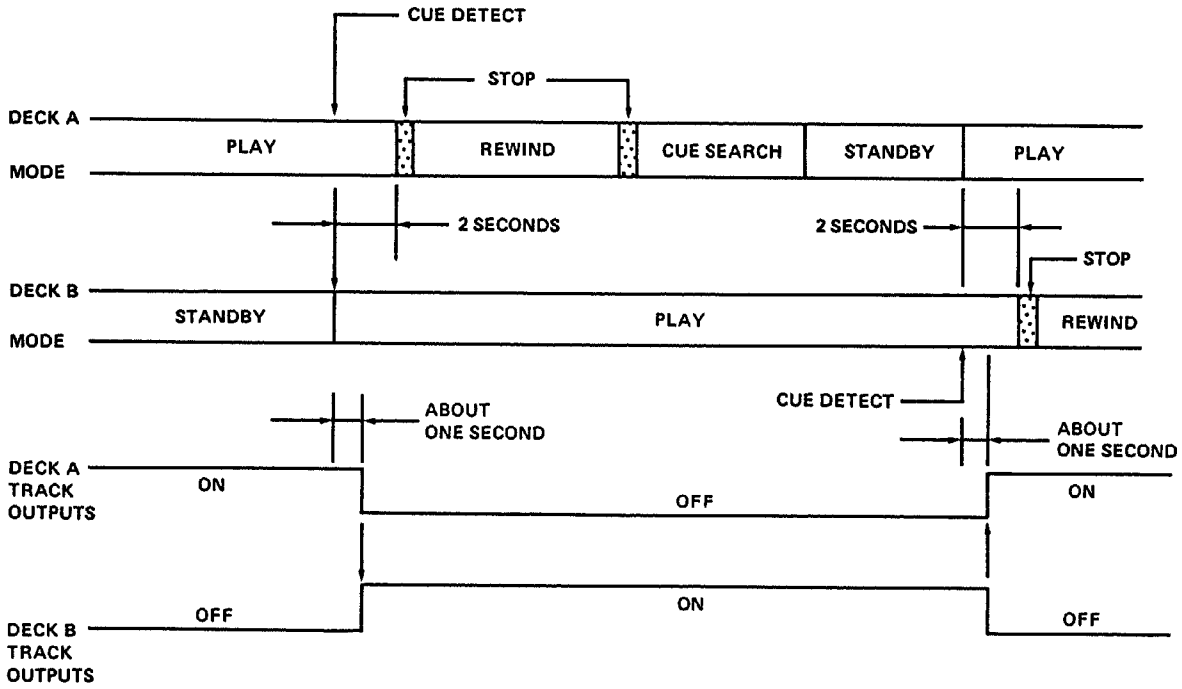

BM6 23 32 00 0 AMBO 00

Tape Reproducer - Block Diagram
Figure 009




BM6 23 32 00 0 ARAO 00

Cassette Tape Arrangement
Figure 010




TIME SCALE NOT PROPORTIONAL TO ACTUAL TIME ELAPSED,
EXCEPT WHERE TIMING IS SHOWN.

BM6 23 32 00 0 ASAD 00

Tape Deck Switching Timing
Figure 011

- the announce control
- program control
- music control

Up to three prerecorded announcements can be selected and will be shown by the LED display on the announcement control section. They can played separately or in turn as required.
The required prerecorded announcement channels can be selected on the program control section.
The music control section allows the required music program to be selected and for control of volume as indicated by the LED display. The unit is also equipped with the door release pushbutton switch for the cassette door

R **ON A/C 101-200,

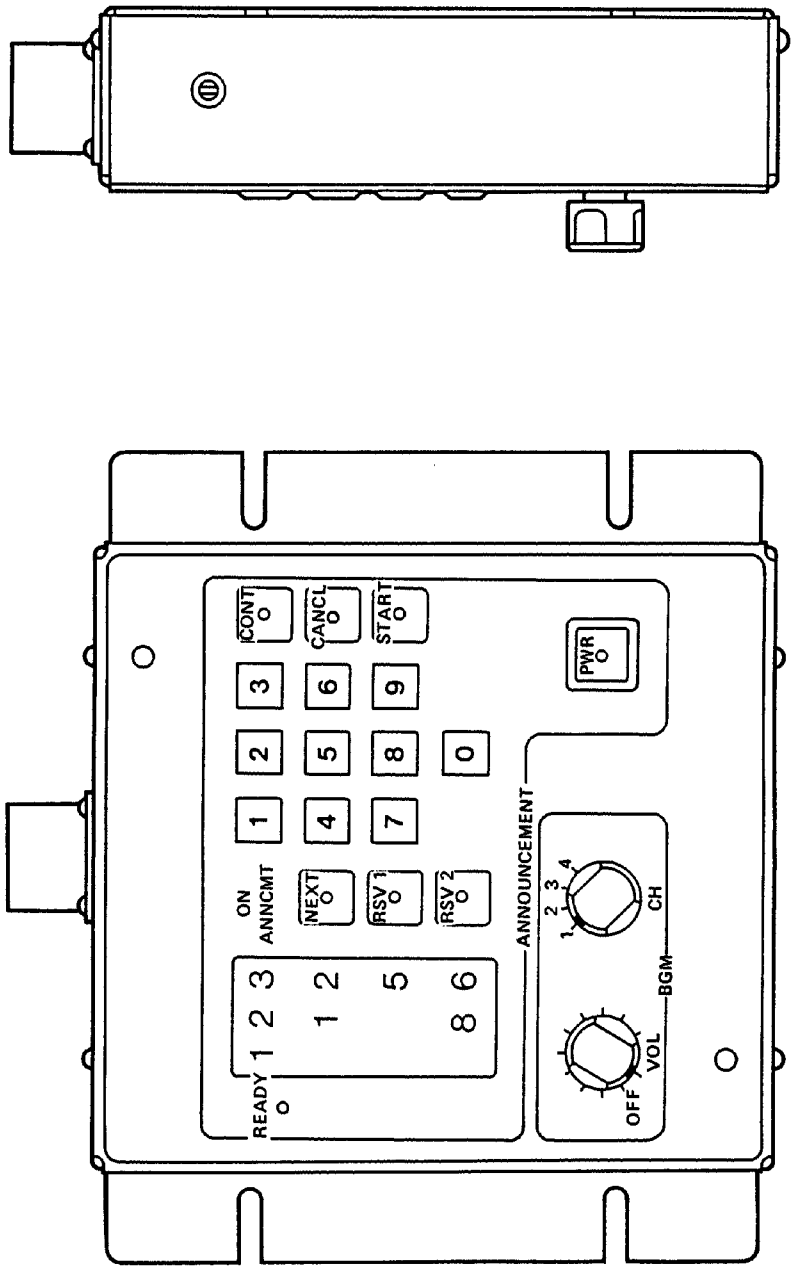
B. Control Unit
The control unit is designed to control the announcement section and the boarding music section.
(1)The announcement section consists of a microcomputer which controls the system and is equipped with key switches, indicator lights and memory displays for programming and playback of the prerecorded announcements. The unit contains the following printed circuit card assemblies housed in a metal case:
- a master control card which contains a microcomputer and memory circuit for overall control of the system.
- a display drive circuit card to operate the light emitting diode (LED) displays and lights.
- a display and key switch card which contains four 2 1/2 digit LED displays, LED indicator lights, control switches and selector switches.

The front panel comprises:
- the LED displays which show the code numbers of the announcement in progress and those of three subsequent keyed-in announcements
- three pushbuttons, NEXT, RSV1 and RSV2 with integral lights, to set the order of announcements' playback
- a READY light to indicate that the tape reproducer tape deck has entered a standby mode in readiness for play
- a keyboard on which the announcement is keyed-in
- CANCL, START and CONT pushbutton with integral lights, to cancel or start an announcement respectively and enable the automatic playback of all three keyed-in announcements
- a PWR pushbutton which turns on the integral light in the button and enables the other pushbuttons and display units.

(2)The boarding music section consists of a four- step channel selector switch and an ON/OFF power switch in conjunction with a volume control potentiometer.
(Ref. Fig. 012)

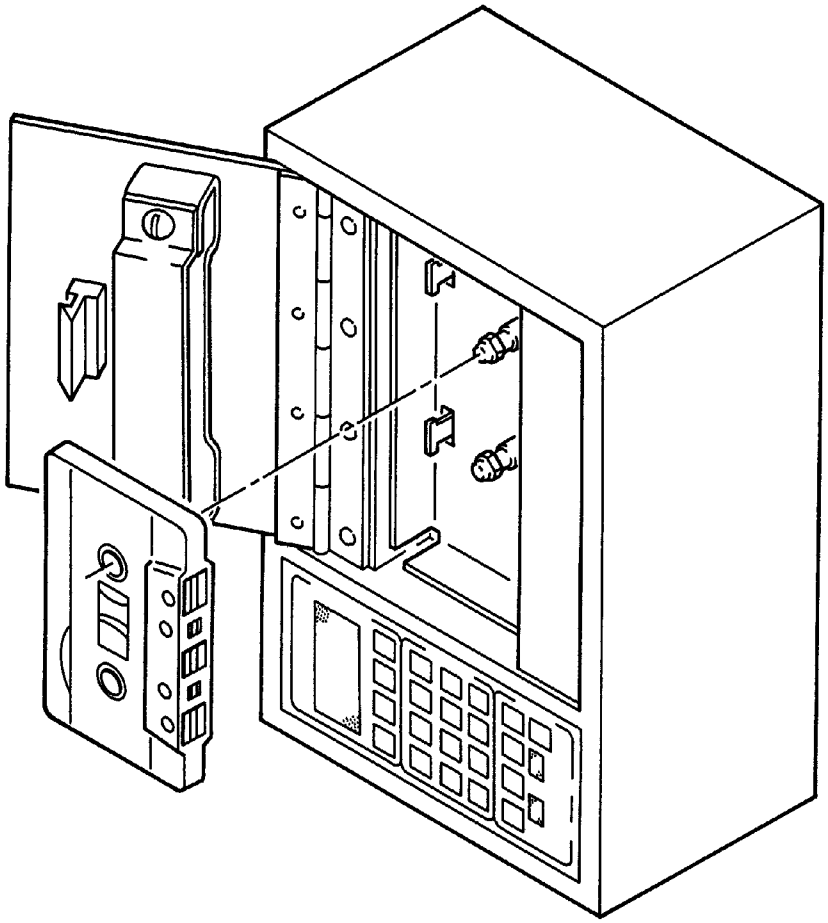
R **ON A/C 001-100,

(Ref. Fig. 013)




BM6 23 32 00 0 ATDO 00

Attendant Control Unit (ACU)
Figure 012



BM6 23 32 00 0 ATHO 00

Attendant Control Unit (ACU)
Figure 013

R **ON A/C 101-200,

5. System Operation

A. Energization
When busbar 105XP-B is energized and circuit breaker 2RX is closed, the
R tape reproducer is energized and supplies 28V DC to the remote control
R unit.

R **ON A/C 001-100,

5. System Operation

A. Energization
When busbar 110PP is energized and circuit breaker 1RX is closed, the announcement reproducer is energized and supplies 28V DC to the remote control unit.

R **ON A/C 101-200,

B. Initiation
Immediately after energization or after a prolonged power interruption of more than 10 sec., the control unit sends an INITIALIZE command signal to the tape reproducer to fully rewind both tape cassettes. The reproducer then enters the SEARCH mode, enabling data such as the announcement code/slot relationship, the number of announcements recorded on the tape and the number of emergency announcement playback times to be read into the tape reproducer microcomputer memory and transferred and stored in the control unit memory circuits. When all data has been read, the tape reproducer enters the STANDBY mode in readiness to receive command signals from the control unit. When the PWR switch on the control unit is pressed ON the integral light comes on and the key switches, the LED lights and display are enabled. The least significant figure in each display will show.

R **ON A/C 001-100,

B. Initiation
The integral light on the ACU illuminates. All LED displays on the announcement section indicate 0 to the right. Memory M1 illuminates.

R **ON A/C 101-200,

C. Announcements
(1)Selection
Three announcements can be initially keyed-in on the control unit as

follows:

(a)Announcement 1

The first announcement to be played back is selected by pressing the **NEXT** button and keying-in the announcement address code. **A** command signal is sent to the tape reproducer, and tape deck **A** is immediately moved forward and entered into a standby mode when the announcement slot is reached. The code is displayed beside the **NEXT** button and the **READY** light comes on when the announcement slot is reached.

(b)Announcement 2

**A** second announcement to be played back after the first, is selected by pressing the **RSV1** button and keying-in the announcement code. Tape deck **B** will move forward and stand by when the relevant slot is reached. The address code is displayed next to the **RSV1** button.

(c)Announcement 3

**A** third announcement for playback after the second can be selected by pressing the **RSV2** button and keying-in the corresponding address code. **At** the end of the first announcement playback, tape deck **A** will move forward and stand by at the selected announcement slot.

(d)Correction

**A** wrongly keyed-in address code can be corrected by simply repressing the respective set button **(NEXT, RSV1** or **RSV2)** and keying-in the new code.

(2)Playback

When the **READY** light is on, playback of the announcements can be initiated with the **NEXT** and **CONT** buttons as follows:

(a)The address code in the **NEXT** display is transferred to the **ON ANNCMT** display when the **START** button is pressed and the designated announcement is broadcast over the **PA** loudspeakers and **PES. The** code numbers displayed in the **RSV1** and **RSV2** displays are similarly transferred to the **NEXT** and **RSV1** displays respectively. **At** the end of the announcement the **ON ANNCMT** display reverts to **'0'. The** announcement, the code number of which is displayed in the **NEXT** display can now be initiated by pressing the **START** button.

(b)When the **CONT** button is pressed, the announcements shown in code in the **NEXT, RSV1** and **RSV2** displays are broadcast consecutively until the last announcement is completed. **During** this mode additional announcements may be keyed in to be broadcast after those already selected.

(c)The **CANCL** button is used to immediately stop an announcement in progress. The corresponding code number in the **ON ANNCMT** display will then be cleared and **'0'** displayed.

(3)Emergency Playback

The emergency announcement is automatically played back in the event of cabin decompression at high altitude. The number of times that the announcement is played back depends on the position of the **DIP** switch in the tape reproducer.

R ****ON A/C 001-100,**

C. Prerecorded Announcements on **EPROM**

(1)Selection
Three announcements can be initially keyed-in on the control unit as follows:
(a)Announcement 1
The first announcement to be played back is selected by keying-in the announcement address code, when LED M1 is on. A command signal is sent to the announcement reproducer to search for the announcement. When the announcement is found, an 'Announcement found' - command is sent to the ACU and the 'Ready' display illuminates.
By pressing the ENTER pushbutton, announcement 1 is locked in and LED M2 comes on.
(b)Announcement 2
A second announcement to be played back after the first, is selected by keying-in the announcement code. The announcement reproducer searches for the announcement and sends a command to the ACU when the reproducer has found the announcement. The address code is displayed beside the M2 LED pressing the ENTER pushbutton and by announcement 2 is locked in and LED M3 comes on.
(c)Announcement 3
A third announcement for playback after the second is selected by keying-in the corresponding announcement code. The announcement reproducer searches for the announcement and sends a command to the ACU when the reproducer has found the announcement. By pressing the ENTER pushbutton, announcement 3 is locked in.
(d)Correction
A wrongly keyed-in address code can be corrected by pressing the CLEAR pushbutton and keying-in the new code. If the reproducer cannot find an announcement, an 'Error'-command is sent to the ACU.
Both wrongly keyed code numbers and failures to find announcements are indicated by an '---' on display.
(2)Playback
When the READY light is on, playback of the announcements can be initiated with the START NEXT button as follows:
(a)The address code in the M1 display is transferred to the ON ANN display when the START NEXT button is pressed and the designated announcement is broadcast over the PA loudspeakers and PES. The code numbers displayed in the M2 and M3 displays are similarly transferred to the M1 and M2 displays respectively. At the end of the announcement the ON ANN display reverts to '0'. The announcement, the code number of which is displayed in the M1 display can now be initiated by pressing the START NEXT button.
(b)When the START ALL button is pressed, the announcements shown in code in the M1, M2 and M3 displays are broadcast consecutively until the last announcement is completed. During this mode additional announcements may be keyed in to be broadcast after those already selected.
(c)The STOP button is used to immediately stop an announcement in progress. The corresponding code number in the ON ANN display will then be cleared and '0' displayed.
(3)Automatic Announcements from EPROM
(a)Emergency Playback
The emergency announcement is automatically played back in the event of

cabin decompression at high altitude. The number of times that the announcement is played back depends on the position of the DIP switch in the announcement reproducer.

(b)Normal Playback

These announcements, when programmed, are automatically activated by turning ON/OFF the FASTEN SEAT BELT and/or the NO SMOKING signs. These announcements override any other reproducer activity except the emergency announcement.

D. Boarding Music Selection

(1)Boarding music is played back when the ON/OFF switch on the control unit 7RX in the music section is turned to the ON position. The BGM volume can be changed by pressing the UP or DOWN key. Volume range is 21 dB in five steps, indicated on display.

By pressing the SEL pushbutton, any of the available BGM channels can be selected. The selected channel is indicated on display. In the ON position the Passenger Address (PA) amplifier keyline is grounded and the audio output from the control unit via the reproducer is fed to the PA amplifier for distribution over the passenger address system loudspeakers.

(2)Access to the music tape cassettes is obtained by entering a reprogrammable access code on the program board and by pressing the DOOR pushbutton.

R **ON A/C 101-200,

R D. Boarding Music Selection
R Boarding music is played back when the BGM ON/OFF switch on the control
R unit 7RX is turned to the ON position. The same switch is used to control
R the volume of the boarding music. Any of the four channels may be manually
R selected by placing the BGM CH selector switch in position 1, 2, 3 or 4.
R In the ON position the Passenger Address (PA) amplifier keyline is grounded
R to feed the audio output from the reproducer to the PA amplifier for dis-
R tribution over the passenger address system loudspeakers. Continuous play-
R back of all tracks is automatically selected by placing the MUSIC CHANNEL
R SELECT switch on the front face of the tape reproducer in AUTO position.
R Any announcement interrupts the music for the duration of the announcement.

E. Self Test

The multi-position test switch on the face of the reproducer is used to select each of the four tracks on either of the two tape decks for testing and monitoring the output of the tapes. When the test switch is placed in one of the four deck A or deck B positions, the tape deck selected enters the PLAY mode, providing it was in the STANDBY mode on completion of an announcement search. The announcement and cue signals on the tape selected are played back via the passenger address and passenger entertainment systems. Output level control is made by adjusting the EMERG and ANNC LEVEL potentiometers on the face of the reproducer.

The test playback can also be monitored using an electric headset of 30 to 300 Ohm impedance connected to the output jack on the reproducer. The

output level cannot be adjusted with the LEVEL potentiometers on the reproducer face but with a trimmer potentiometer inside the reproducer.

1. Operational Test

A. Reason for the Job
(1)Operational test of announcement - music tape reproducer system

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz<br>Prerecorded Announcement Test Tape |

Referenced Procedures

| | |
|---|---|
| - 23-31-00, P. Block 501 | Passenger Address System |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 35-21-00, P. Block 501 | Passenger Oxygen System |
| - 33-26-00, P. Block 501 | Passenger Lighted Signs |

R **ON A/C 001-100,

C. Procedures
(1)Job Set-Up
(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)Make certain that the passenger address system is working (Ref. 23-31-00, P. Block 501).
(d)Make certain that the passenger lighted signs system is working (Ref. 33-26-00, P. Block 501).
(e)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | PASSENGER OXYGEN - CTL & WARN | 1WR | H24 |
| 22VU | PASSENGER OXYGEN - ACTUATION | 2WR | H25 |

(f)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 132VU | TAPE REPRODUCER | 1RX | L77 |

R **ON A/C 101-200,

C. Procedures
(1)Job Set-Up
(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that flight compartment and electronics racks air distribution system is correct.
(c)Make certain that the passenger address system is working (Ref. 23-31-00, P. Block 501).
(d)Make certain that the passenger lighted signs system is working (Ref. 33-26-00, P. Block 501).
(e)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | PASSENGER OXYGEN - CTL & WARN | 1WR | H24 |
| 22VU | PASSENGER OXYGEN - ACTUATION | 2WR | H25 |

(f)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 132VU | TAPE REPRODUCER | 2RX | L76 |

R **ON A/C 001-100,

NOTE : Ensure that tape cassette is loaded in the Attendant Control Unit (ACU) for music programs. Access to ACU is gained by entering code '000' in the PROGRAM section and by pressing the switch DOOR in the MUSIC section. Integral light on Attendant Control Unit (ACU) illuminates, on ANNOUNCE Section all LEDs indicate '--0' and LED 'M1' is on.

R **ON A/C 101-200,

NOTE : All pushbutton switches except pushbutton switch CANCL illuminate when in action.

(2)Test
(a)Test of recorded announcements

| ACTION | RESULT |
|---|---|
| 1. At purser's station Attendant Control Unit (ACU) 7RX:<br>- press pushbutton switch PWR.<br><br>- press pushbutton switch NEXT and select a defined channel (012) on keyboard. | At purser's station ACU:<br>- on display number 0 appears in each row RH.<br>- integral light in pushbutton switch PWR stays on.<br>- on display preselected channel (012) appears beside pushbutton switch NEXT.<br>- after max. 30 sec. READY light |

| ACTION | RESULT |
|---|---|
| | comes on. |
| - press pushbutton switch **RSV1** and select a defined channel (015) on keyboard. | - on display preselected channel (015) appears beside pushbutton switch **RSV1**. |
| - press pushbutton switch **RSV2** and select a defined channel (020) on keyboard. | - on display preselected channel (020) appears beside pushbutton switch **RSV2**.<br>- **READY** light remains on. |
| - press pushbutton switch **START**. | - on display preselected channel (012) appears beside legend **ON ANNCMT**.<br>- on display preselected channel (015) appears beside legend **NEXT**.<br>- on display preselected channel (020) appears beside legend **RSV1**.<br>- on display number 0 appears **RH** beside legend **RV2**.<br>Passenger compartment:<br>- check reception of recorded announcement at cabin and lavatory speakers.<br>At purser's station **ACU**:<br>- after announcement is made, on display number 0 appears **RH** beside legend **ON ANNCMT**. |
| - when **READY** light comes on press pushbutton switch **START**. | - on display preselected channel (015) appears beside legend **ON ANNCMT**.<br>- on display preselected channel (020) appears beside legend **NEXT**.<br>- on display number 0 appears **RH** beside legend **RSV1**.<br>Passenger compartment:<br>- check reception of recorded announcement (015) at cabin and lavatory speakers.<br>At purser's station **ACU**:<br>- after announcement is made, on display number 0 appears **RH** beside legend **ON ANNCMT**. |
| - wait for **READY** light and press pushbutton switch **START**. | - on display preselected channel (020) appears beside legend **ON ANNCMT**.<br>- on display number 0 appears **RH** beside legend **NEXT**.<br>- at end of announcement (020) in each row on display number 0 appears **RH**.<br>Passenger compartment: |

| ACTION | RESULT |
|---|---|
| | - program continues to be broadcast at cabin and lavatory speakers. |
| 2. At purser's handset panel 878VU:<br>- lift handset, press PA pushbutton switch. | Passenger compartment:<br>- a passenger address attention chime is broadcast over cabin and lavatory speakers. |
| - press PTT pushbutton on handset and make announcement while tape announcement is being made. | - check reception of spoken announcement from purser station at cabin and lavatory speakers. |
| 3. At purser's handset panel 878VU:<br>- replace handset. | Passenger compartment:<br>- recorded announcement is broadcast over cabin and lavatory speakers. |
| 4. At purser's station ACU:<br>- press pushbutton switch PWR. | At purser's station ACU:<br>- LED's in display extinguish.<br>- integral light in pushbutton switch PWR stays on. |
| 5. At purser's station ACU:<br>- repeat step (2) but instead of push-button switch START use pushbutton switch CONT. | At purser's station ACU:<br>- on display each preselected channel will automatically advance up LED display in turn and appear against legend ON ANNCMT.<br>Passenger compartment:<br>- preselected announcements are broadcast in turn at cabin and lavatory speakers. |

NOTE: During running of announcements, selection of further channels by pushbutton switches RSV2, RSV1 and NEXT is possible.

| | |
|---|---|
| 6. At purser's station ACU:<br>- while announcement is running, press pushbutton switch CANCL. | At purser's station ACU:<br>- on LED display beside ON ANNCMT number 0 appears RH.<br>Passenger compartment:<br>- announcement stops. |
| - press pushbutton switch PWR. | At purser's station ACU:<br>- LED display extinguishes. |

R **ON A/C 001-100,

(2)Test
(a)Test of Prerecorded Announcements and Music

| ACTION | RESULT |
|---|---|
| 1. At purser's station Attendant Control Unit (ACU) 7RX in MUSIC section:<br>- press music ON/OFF pushbutton switch to ON position, select a music channel and activate the UP-DOWN volume control pushbutton | Passenger compartment:<br><br>At ACU (7RX) in MUSIC section:<br>- selected music channel and volume level are indicated by LEDs.<br>- check reception of music program |

| ACTION | RESULT |
|---|---|
| switch until required audio level is obtained. | at cabin and lavatory speakers and that program audio adjusts to required level. |
| 2. On **ACU PROGRAM** section: | On **ACU ANNOUNCE** section: |
| - select a defined code 1 (001) on keyboard. | - on display, preselected code --1 appears beside **LED M1**. |
| - press pushbutton switch **ENTER**. | - **READY** light comes on.<br>- **LED M2** comes on. |
| - select code 996 (996) on keyboard. | - 996 appears beside **LED M2**. |
| - press pushbutton switch **CLEAR**. | - on display --0 appears beside **LED M2**. |
| - select code 2 (002) on keyboard. | - on display, preselected code --2 appears beside **LED M2**. |
| - press pushbutton switch **ENTER**. | - **READY** light is on. |
| - select code 3 (003) on keyboard. | - on display, preselected code --3 appears beside **LED M3**. |
| - press pushbutton switch **ENTER**. | - **READY** light is on. |
| 3. On **ACU ANNOUNCE** section: | Passenger compartment: |
| - press pushbutton switch **START NEXT**. | - music program stops and prerecorded announcement is broadcast at cabin and lavatory speakers. **READY** light goes off.<br>On **ACU ANNOUNCE** section:<br>- preselected announcement from **M1** appears beside **ON ANN** as long as announcement is broadcast then it turns back to blank and **READY** light comes on.<br>- the other preselected announcements change from **M2** and **M3** to **M1** and **M2** |
| 4. On **ACU PROGRAM** section: | On **ACU ANNOUNCE** section: |
| - select code 4 (004) on keyboard. | - on display, preselected code --4 appears. |
| - press pushbutton switch **ENTER**. | - **READY** light is on.<br>Cabin compartment: |
| - press pushbutton switch **START NEXT**. | - the appropriate announcement is broadcast at cabin and lavatory speakers. |
| 5. At purser's handset panel **878VU**: | Passenger compartment: |
| - lift handset, press **PTT** pushbutton on handset and make announcement while tape announcement is being. made. | - check reception of spoken announcement from purser station at cabin and lavatory speakers. |
| 6. At purser's handset panel **878VU**: | Passenger compartment: |
| - replace handset. | - recorded announcement is broadcast over cabin and lavatory speakers. |
| 7. On **ACU ANNOUNCE** section: | Passenger compartment: |
| - when prerecorded announcement | - preselected announcements are |

| ACTION | RESULT |
|---|---|
| stops, press pushbutton switch **START ALL.** | broadcast in turn at cabin and lavatory speakers.<br>On **ACU ANNOUNCE** section:<br>- on display each preselected channel will automatically advance up **LED** display in turn and appear against legend **ON ANN.** |
| - when the last announcement is being broadcast, press push-button switch **STOP.** | Passenger compartment:<br>- announcement stop, music program comes on.<br>On **ACU** in **ANNOUNCE** section:<br>- on display beside **ON ANN** is blank.<br>- **READY** light is steady on. |
| 8. On **ACU** in **MUSIC** section:<br>- press pushbutton switch **ON/OFF** to **OFF** position. | Passenger compartment:<br>- music program stops. |

NOTE : Emergency announcement and announcements by code 001 thru 049 are digital integrated on **ROM** and **EPROM.** Code 226 is used for self-test, a defect will be broadcast over cabin speakers. Code 227 broadcasts trouble shooting by fault over cabin speakers.

(b)Broadcast of Emergency Announcement

| ACTION | RESULT |
|---|---|
| 1. On **ACU (7RX)** in **PROGRAM** section:<br>- select code 2 (002) on keyboard. | On **ACU** in **ANNOUNCE** section:<br>- on display, preselected code --2 appears beside **LED M1.**<br>- **READY** light is on. |
| - press pushbutton switch **ENTER.** | |
| 2. On **ACU ANNOUNCE** section:<br>- press pushbutton switch **START NEXT.** | Passenger compartment:<br>- check reception of recorded announcement at cabin and lavatory speakers. |
| 3. On relay **19WR** in panel **282VU:**<br>- bridge contacts **A** and 2 while preselected announcement is running. | Passenger compartment:<br>- previously selected announcement stops and emergency announcement is broadcast at cabin and lavatory speakers with increased level. |
| 4. On **ACU ANNOUNCE** section:<br>- press pushbutton switch **STOP** | - announcement stops. |
| 5. On relay **19WR** in panel **282VU:**<br>- remove bridge between contacts **A** and 2. | |

R **ON A/C 101-200,

R (b)Broadcast of Emergency Announcement

| R ACTION | RESULT |
|---|---|
| R 1. At purser's station ACU: | At purser's station ACU: |
| R - press pushbutton switch PWR. | - integral light in pushbutton switch PWR stays on. |
| R | - on display number 0 appears in each row RH. |
| R - press pushbutton switch NEXT and select a defined channel (012) on keyboard. | - on display preselected channel (012) appears beside pushbutton switch NEXT. |
| R | - after max. 30 sec. READY light comes on. |
| R - press pushbutton switch RSV1 and select a defined channel (015) on keyboard. | - on display preselected channel (015) appears beside pushbutton switch RSV1. |
| R - press pushbutton switch RSV2 and select a defined channel (020) on keyboard. | - on display preselected channel (020) appears beside pushbutton switch RSV2. |
| R - press pushbutton switch CONT. | - on display each preselected channel will automatically advance up LED screen in turn and appear against legend ON ANNCMT. |
| R | Passenger compartment: |
| R | - preselected announcements are broadcast in turn at cabin and lavatory speakers. |
| R 2. On relay 19WR in panel 282VU: | Passenger compartment: |
| R - bridge contacts A and 2 while preselected announcement is running. | - previously selected announcement stops and emergency announcement is broadcast at cabin and lavatory speakers with increased audio level. |
| R 3. On relay 19WR in panel 282VU: | |
| R - remove bridge between contacts A and 2. | |
| R At purser's station ACU: | At purser's station ACU: |
| R - press pushbutton switch PWR. | - LED display extinguishes. |
| R | - integral light in pushbutton switch PWR goes off. |

(c)Broadcast of Boarding Music

| ACTION | RESULT |
|---|---|
| 1. At purser's station ACU (7RX): | |
| - on BGM control panel switch | |

| ACTION | RESULT |
|---|---|
| channel selector to position 1. Switch VOL control on and rotate potentiometer clockwise thru Complete range. | Passenger Compartment: - verify that boarding music played over the PA Speakers varies smoothly in volume from minimum to maximum. |
| 2. Repeat step 1 for channel 2 thru 4 instead of channel 1. | Passenger compartment: - same result as in 1. |
| 3. At purser's station ACU: - press pushbutton CONT. | Passenger compartment: - music program stops. Preselected announcement is broadcast at cabin. |
| - press pushbutton CANCL. | Passenger compartment: - music program continues to be broadcast at cabin. |
| 4. At purser's station ACU: - turn VOL control off. | Passenger compartment: - music program goes off. |

R **ON A/C 001-100,

(c)Broadcast of Boarding Music

| ACTION | RESULT |
|---|---|
| 1. On ACU (7RX) in MUSIC section: - press music ON/OFF pushbutton switch to ON position, select a music channel and press the VOLUME pushbutton switches to adjust volume until a required audio level is obtained. | Passenger compartment: - verify that boarding music played over the PA speakers varies according the volume adjustment. |
| 2. On ACU (7RX) in PROGRAM section: - select a defined code on keyboard. | Passenger compartment: - on display preselected code appears beside LED. |
| - press ENTER. | - READY light is on. |
| - press START NEXT. | Passenger compartment: - music program stops. - preselected announcement is broadcast at cabin and lavatory speakers. |

| ACTION | RESULT |
|---|---|
| 3. On ACU in ANNOUNCE section:<br>- press pushbutton switch STOP. | Passenger compartment:<br>- music program continues to be broadcast at cabin and lavatory speakers. |
| 4. On ACU in MUSIC section:<br>- select another music program. | Passenger:<br>- music program changes.<br>On ACU in MUSIC section:<br>- on LED display selected code is indicated. |
| 5. On ACU in MUSIC section:<br>- press pushbutton switch ON/OFF to OFF position. | Passenger compartment:<br>- music program stops. |

(d)Broadcast of Prerecorded Announcement with Automatic Release. (if programed)

| ACTION | RESULT |
|---|---|
| 1. On panel 423VU:<br>- switch 'NO SMOKING' switch to ON position.<br>- switch 'NO SMOKING' switch to OFF position. | Cabin compartment:<br>- respective announcement is broadcast at cabin and lavatory speakers. |
| 2. On panel 423VU:<br>- switch 'SEAT BELTS' switch to 'ON' position.<br>- switch 'SEAT BELTS' switch to 'OFF' position. | Cabin compartment:<br>- respective announcement is broadcast at cabin and lavatory speakers. |
| 3. On ACU (7RX) in PROGRAM section:<br>- select code 11 (011).<br>- press pushbutton switch ENTER.<br>- press pushbutton switch START NEXT: | On ACU in ANNOUNCE section:<br>- on display, preselected code 011 appears beside LED M1.<br>- when the program is located, READY light comes on.<br>Cabin compartment:<br>- prerecorded announcement is broadcast at cabin and lavatory speakers. |
| 4. On panel 423VU:<br>- while prerecorded announcement is running, switch 'NO SMOKING' switch to ON position.<br>- switch 'NO SMOKING' switch to OFF position. | Cabin compartment:<br>- only respective NO SMOKING announcement is broadcast at cabin and lavatory speakers. |

R **ON A/C ALL

(3)Close-Up
(a)Restore aircraft to initial configuration.
(b)De-energize the aircraft electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).
(c)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

# TAPE REPRODUCER - REMOVAL/INSTALLATION

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| | Circuit Breaker Safety Clips |
| | Blanking Caps |
| Referenced Procedure<br>- 23-32-00, P. Block 501 | Announcement - Music Tape Reproducer System |

## 2. Procedure

(Ref. Fig. 401)

(1)Open, safety and tag the following circuit breaker :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 132VU | TAPE REPRODUCER | 1RX | 324/L77 |

B. Removal

(1)Loosen nuts (5) to free tape reproducer studs (4).
(2)Remove tape reproducer from mounting tray (6).
(3)Remove tape reproducer.

C. Installation

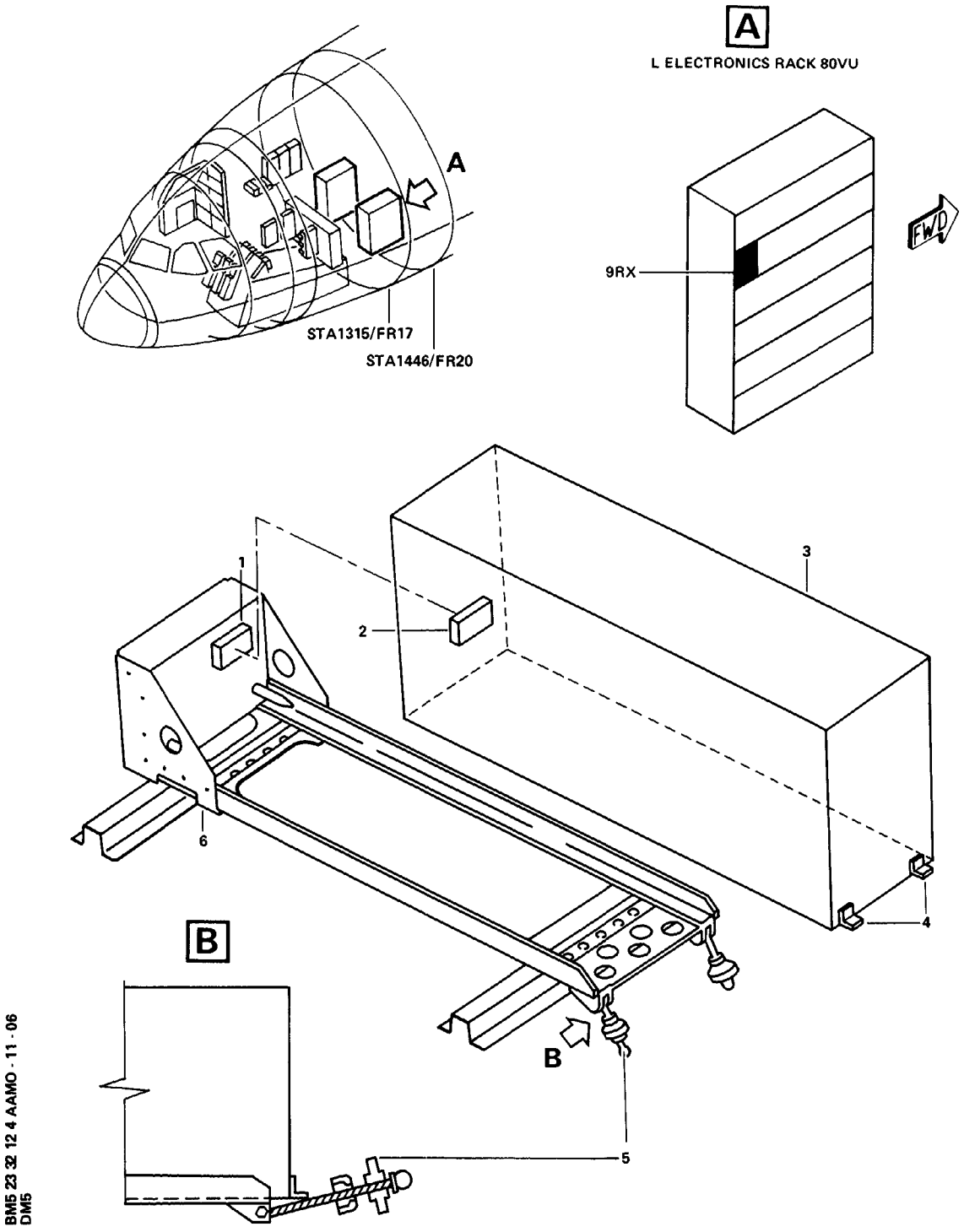
(1)Clean and inspect tape reproducer interface.
(2)Make certain that electrical connectors (1) and (2) are in correct condition.
(3)Position tape reproducer on mounting tray and slide it to bottom of rack.
(4)Tighten nuts (5) on tape reproducer studs (4).
(5)Remove safety clip and tag and close circuit breaker 1RX.

D. Test

Carry out operational test of Announcement-Music Tape Reproducer System (Ref. 23-32-00, P. Block 501).

E. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.




Tape Reproducer
Figure 401

# PASSENGER ENTERTAINMENT (MUSIC) - DESCRIPTION AND OPERATION

## 1. GENERAL

The Passenger Entertainment - Music (PES) provides pre-recorded audio entertainment programs for the passengers. Programs can be individually selected and heard over a headset, connected to the Passengers Control Unit (PCU) mounted in the seat armrest.

## 2. Component Location

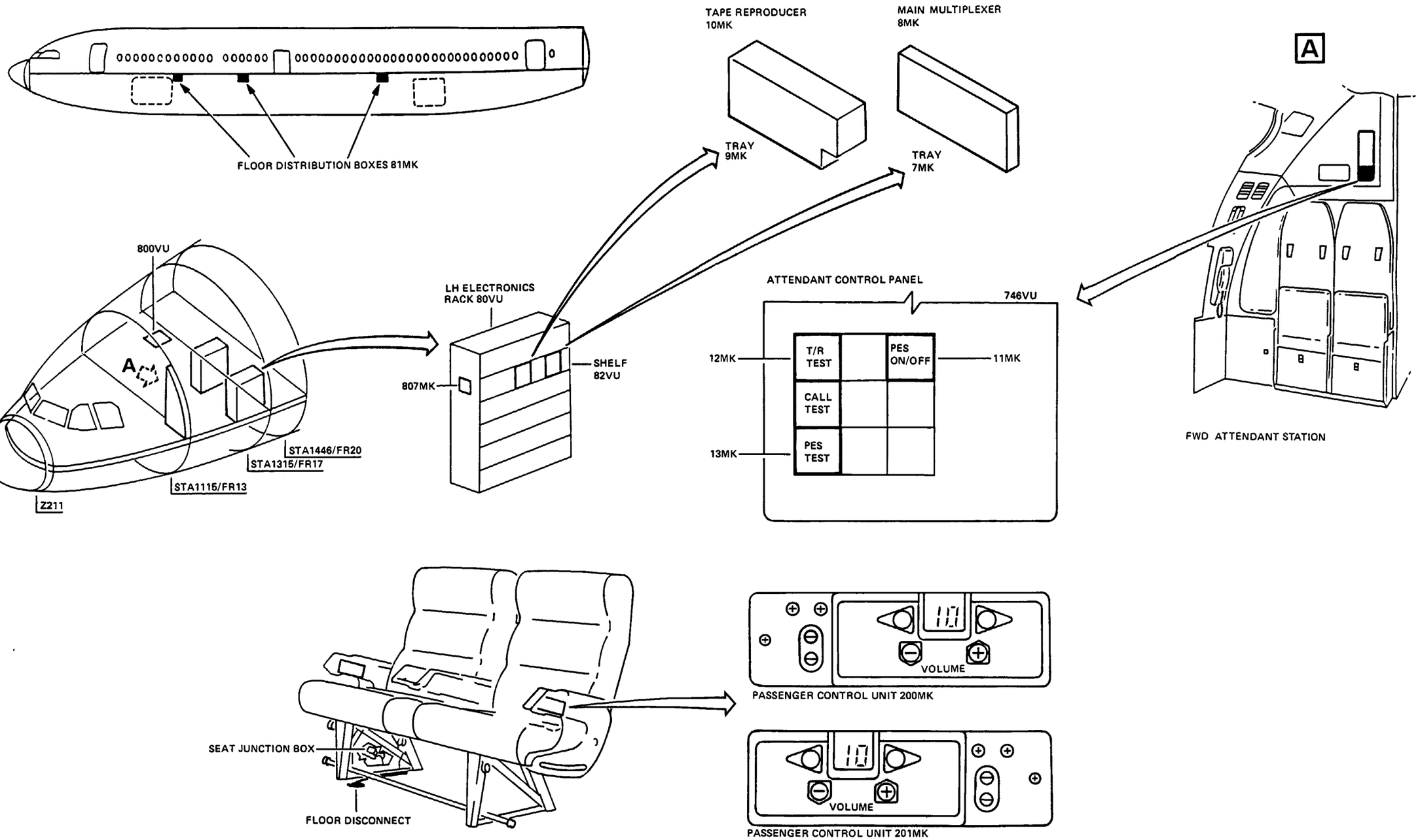
(Ref. Fig. 001)
(Ref. Fig. 002)

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 7MK | TRAY FOR MAIN MULTIPLEXER | 80VU | 121 | | |
| 8MK | MAIN MULTIPLEXER | 80VU | 121 | | |
| 9MK | TRAY FOR AUDIO REPRODUCER | 80VU | 121 | | |
| 10MK | AUDIO REPRODUCER | 80VU | 121 | | |
| 11MK | PUSHBUTTON SWITCH | 746VU | 221 | | |
| 12MK | PUSHBUTTON SWITCH | 746VU | 221 | | |
| 13MK | PUSHBUTTON SWITCH | 746VU | 221 | | |
| 80MK | FLOOR DISCONNECT BOX | | 100 | | |
| 81MK | FLOOR DISTRIBUTION BOX | | 100 | | |
| 100MK | SEAT ELECTRONIC BOX | | 200 | | |
| 200MK | PASSENGER CONTROL UNIT (PCU) R/H | | 200 | | |
| 201MK | PCU L/H | | 200 | | |
| 807MK | RELAY | 80VU | | | |

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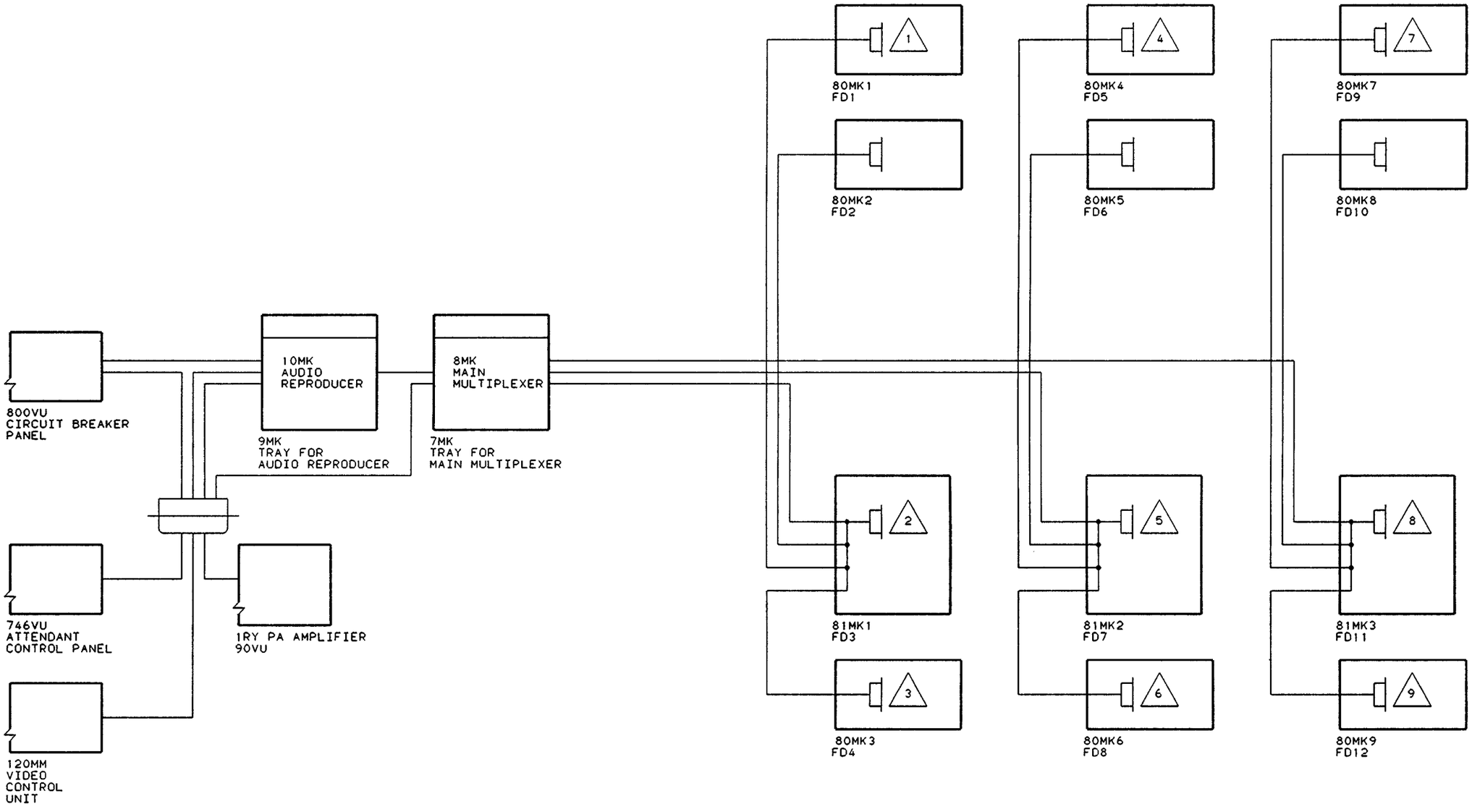


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BM6 23 33 00 0 BAMO 00

Passenger Entertainment (Music) - Component Location
Figure 001




B M 6 23 33 00 0 BCRA 00

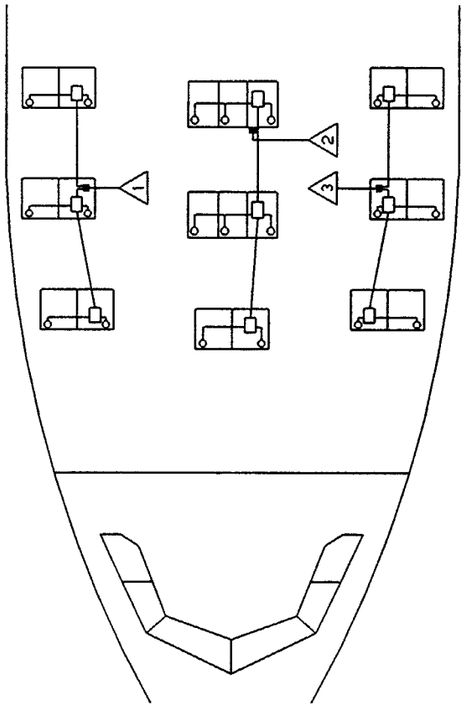
PES, Passenger Control Unit (PCU)
Electronic Box - Location (Sheet 1/4)
Figure 002

EFFECTIVITY: 001-100,

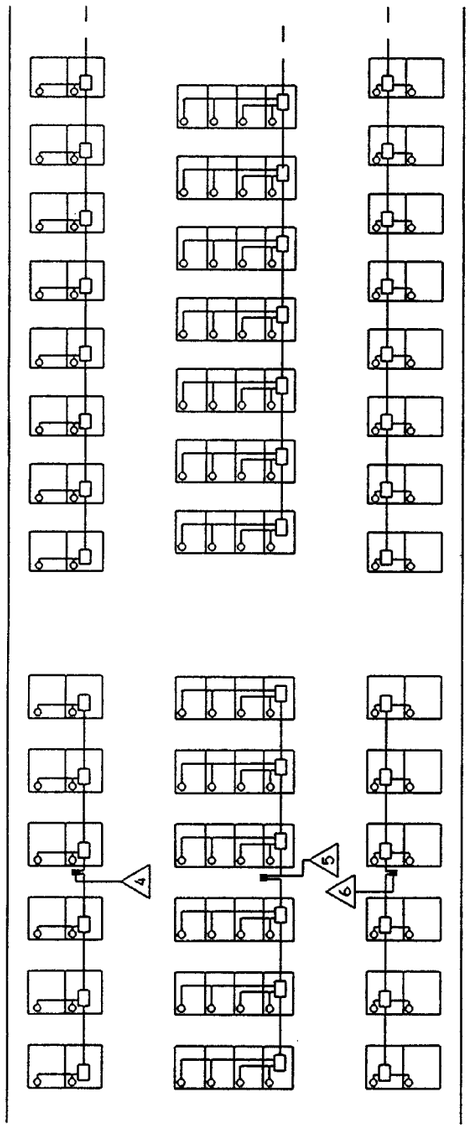
PIA



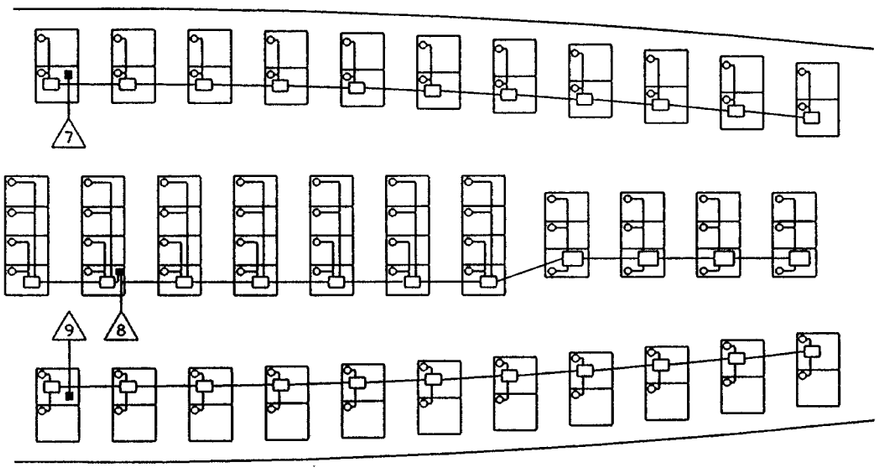
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| SEATS RH | | |




| SEATS RH | | |




| 81MK3 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 80MK7 | | | | | | | | | | |
| 91MK4 | 91MK5 | | | | | | | | | |
| | | 112MK13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| | | | | | | | | | | |
| 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 |
| | | | | | | | | | | 180MK10 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 80MK8 | | | | | | | | | |
| | | | | | | | | | | |
| | 91MK8 | 91MK9 | | | | | | | | |
| | | | | | | | | | | |
| 33 | | | 112MK34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| | | | | | | | | | | |
| 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 | 152MK1 | 2 | 3 | 4 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 | | | | |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 | | | | |
| | | | | | | | | | | |
| 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 |
| 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 |
| 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 |
| 147 | 148 | 149 | 150 | 151 | 152 | 153 | | | | |
| | | | | | | | | | | 80MK14 |
| | 181MK5 | 181MK6 | | | | | | | | |

| 80MK9 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 91MK13 | 91MK14 | | | | | | | | | |
| | | 112MK54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 |
| 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 |
| | | | | | | | | | | |
| 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 |
| 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 |
| | | | | | | | | | | 180MK18 |

| | | |
|---|---|---|
| SEATS RH | FLOOR DISTRIBUTION BOX | |
| | FD | |
| | CA FD-SEB | |
| | CA SEB-SEB | |
| | SEB | |
| | CA SEB-PCU | |
| | CA SEB-PCU | |
| | PCU | |
| | PCU | |
| | | |
| | TERMINATOR FD | |
| SEATS CENTER | FD | |
| | CA FD-SEB | RH |
| | CA FD-SEB | LH |
| | CA SEB-SEB | RH |
| | CA SEB-SEB | LH |
| | SEB | RH |
| | SEB | LH |
| | CA SEB-PCU | |
| | CA SEB-PCU | |
| | CA SEB-PCU | |
| | CA SEB-PCU | |
| | PCU | |
| | PCU | |
| | PCU | |
| | PCU | |
| | TERMINATOR SEB | |
| | TERMINATOR SEB | |
| | TERMINATOR FD | |
| | TERMINATOR FD | |
| SEATS LH | FD | |
| | CA FD-SEB | |
| | CA SEB-SEB | |
| | SEB | |
| | CA SEB-PCU | |
| | CA SEB-PCU | |
| | PCU | |
| | PCU | |
| | TERMINATOR SEB | |
| | TERMINATOR FD | |

PES, Passenger Control Unit (PCU)
Electronic Box - Location (Sheet 4/4)
Figure 002

EFFECTIVITY: 001-100,

PIA

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3. System Description

Audio from a tape reproducer and VIDEO AUDIO is supplied to the 12 audio channels the Main Multiplexer (MM). This analog input is processed by circuits in the MM that prepare it for conversion to digital data that is sent serially to the Seat Electronic Box (SEB) via Floor Distribution/Disconnect Boxes.

The audio presented to the MM can be stereophonic. In this case, one monophonic channel from the tape reproducer is programmed as the 'left' channel of a stereo pair, while another normally monophonic channel is programmed as the 'right' channel. Switches within the MM allow for this programming flexibility. The MM can have various combinations of 'mono' and/or 'stereo', up to fourteen or seven respectively.

The mechanical switches in the MM are used to program the 14 audio channels for 2 stereo and 8 mono programs. The digitalized and multiplexed tape reproducer audio from the MM is sent to each SEB through the Floor Disconnect/Distribution Boxes for conversion back to analog audio. The MM (tape reproducer audio)/(video audio) digital audio is converted back to its original analog form by the SEB, amplified, and under control of the PCU channel select switch, fed to the audio transducer or an electric jack contained within the PCU.

A passenger may listen to this audio by inserting his pneumatic headset into the transducer or his electric headset into the electric jack within the PCU. The transducer consists of two small loudspeakers mounted within a plastic housing.

The audio is prevented from leaking out by springloaded plungers in the holes where the headset is inserted. When the headset is inserted, it depresses the plungers and allows the audio to travel up the tubes of the headset to the passenger's ears. The passenger may change audio program channels by rotating the channel select switch of the PCU. The audio level is controlled by the volume control on the PCU.

In the PES there are 14 channels allocated for the processing of audio information from the tape reproducer and video systems.

Channel 15 is reserved as a command channel for giving instructions to the SEB's such as whether the channel it is selecting should be processed as a stereo or mono program. It is also used for encoding System Test information.

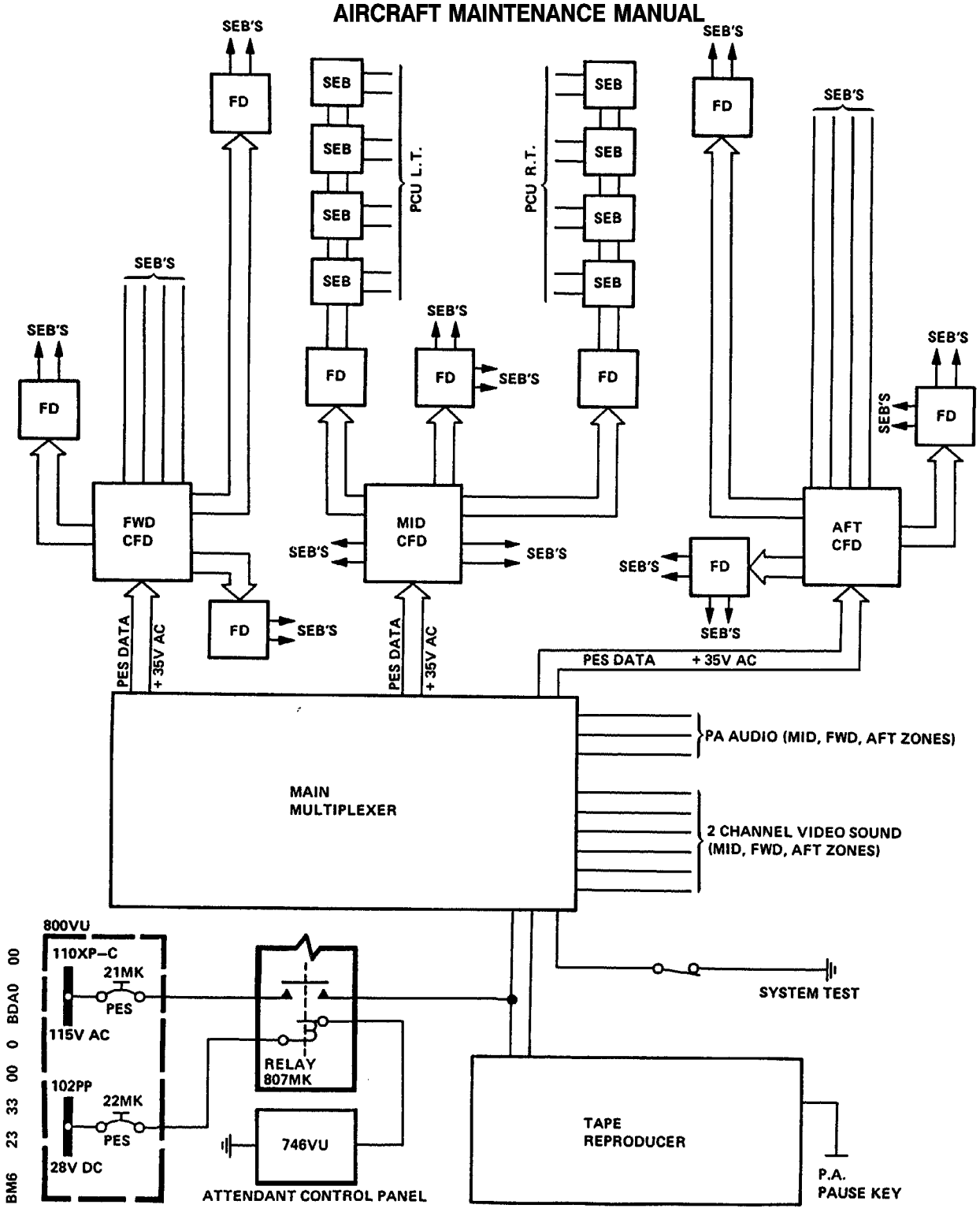
(Ref. Fig. 003)
(Ref. Fig. 004)

4. Power Supply

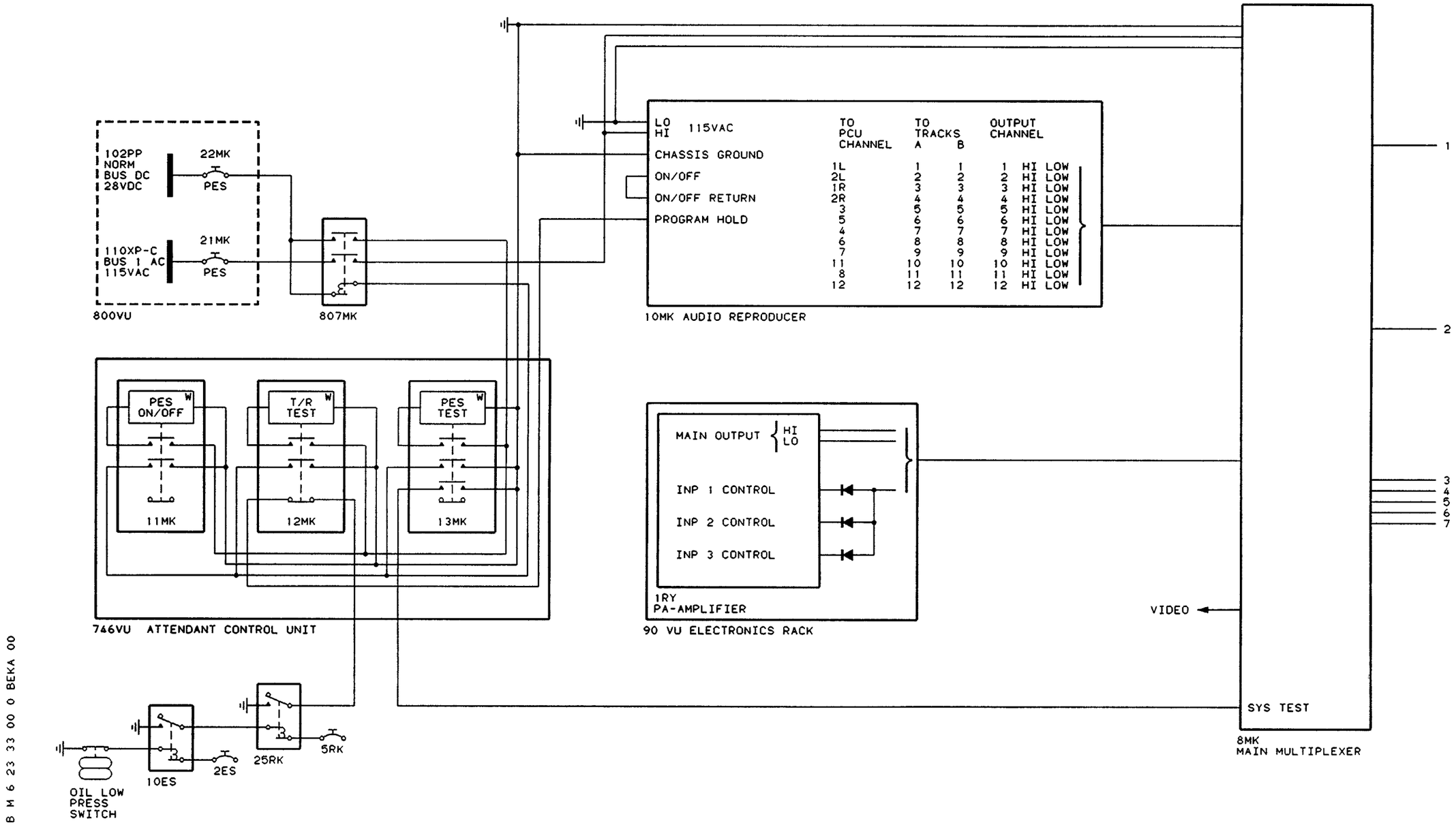
The system is supplied with 115 V AC from busbar 110XP-C via circuit breaker PES 21MK and with 28 V DC from busbar 102PP via circuit breaker PES 22MK on C/B Panel 800VU.
(Ref. Fig. 005)

5. Component Description

A. Tape Reproducer
(1)Description




Passenger Entertainment (Music) - Block Diagram
Figure 003

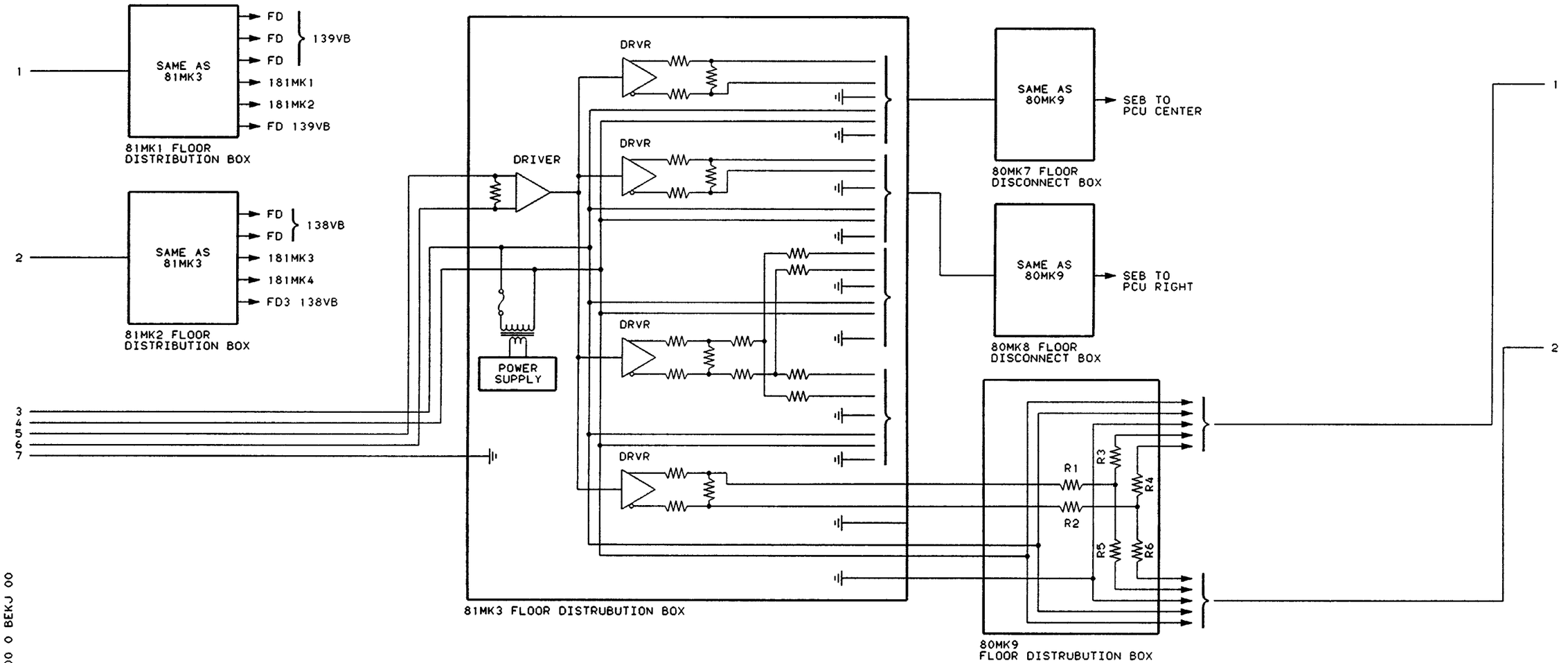



B M 6 23 33 00 0 BEKA 00

System Passenger Entertainment (Music)
System Schematic (Sheet 1/3)
Figure 004

EFFECTIVITY: 001-100,

PIA




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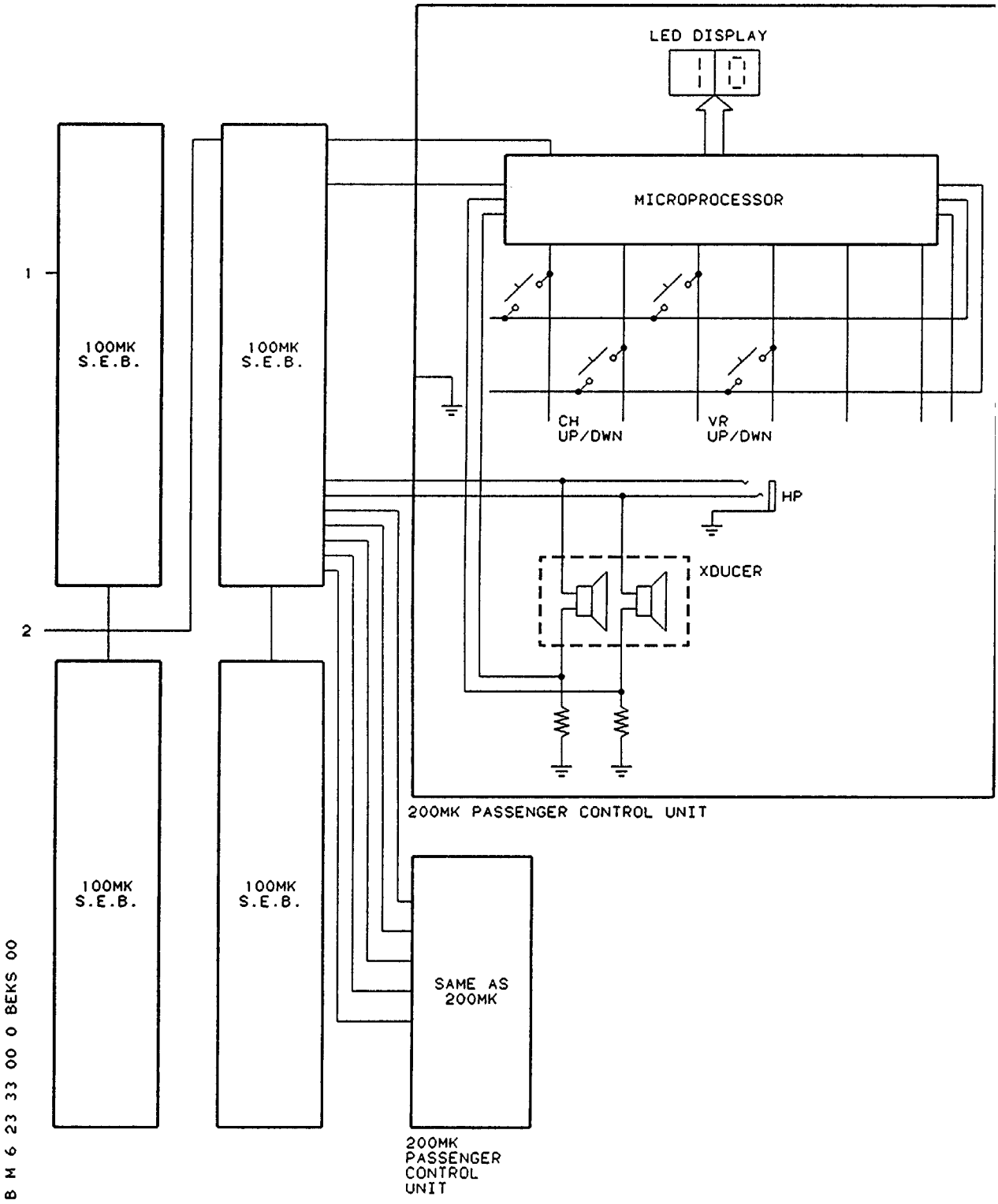
System Passenger Entertainment (Music)
System Schematic (Sheet 2/3)
Figure 004

EFFECTIVITY: 001-100,

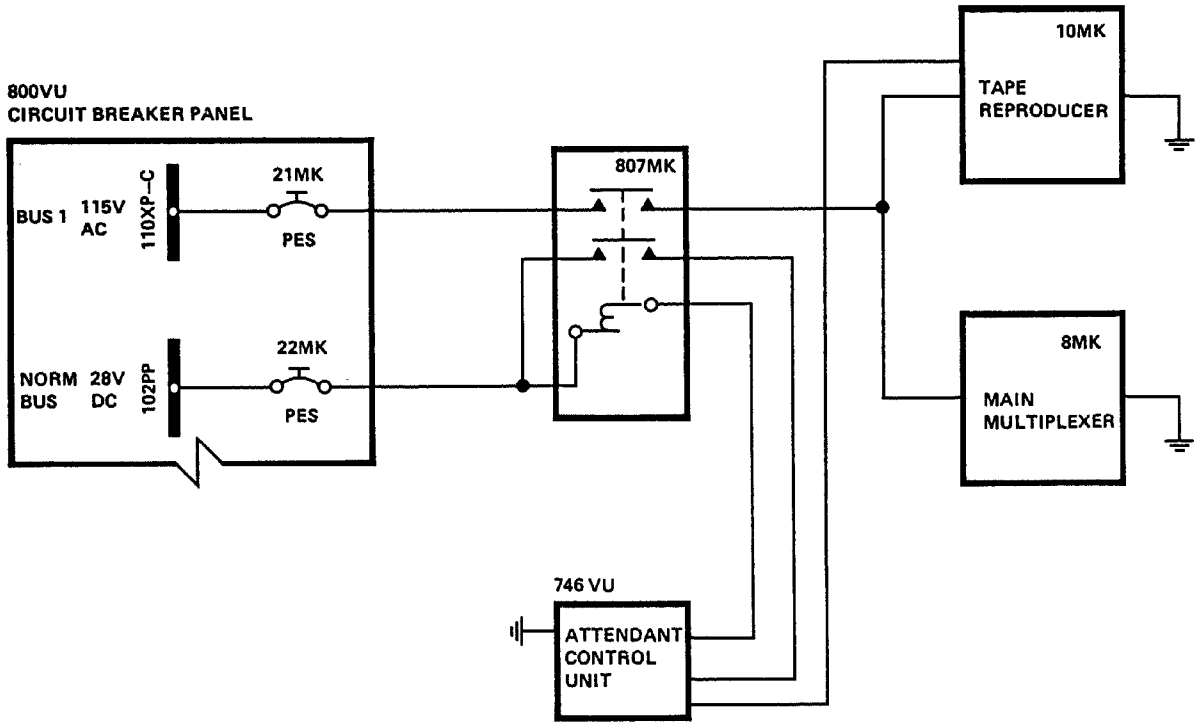
PIA



Printed in France




System Passenger Entertainment (Music)
System Schematic (Sheet 3/3)
Figure 004




PASSENGER ENTERTAINMENT (MUSIC)
POWER SUPPLY

BM6 23 33 00 0 BGAO 00

Power Supply - Block Diagram
Figure 005

The reproducer is designed to playback 12 channels of audio entertainment pre-recorded on six cassette tapes and consists of the following main assemblies:
- six tape decks
- a motor control and head amplifier card
- an interface card
- a main circuit card.

Each tape deck is fitted with a capstan and a reel motor to drive the cassette tapes. The capstan motor moves the tape in one direction only for playback while the reel motor drives the take-up reel during playback and rewinds the tape. A 4 channel magnetic head on each tape deck is used to playback the audio programs in conjunction with two solenoids which position and hold the head and pinch roller in contact with the tape.

A motor control and head amplifier card fitted to each tape deck feeds the reproduced audio signal via an interface card assembly to the main circuit card assembly. This card contains four head pre-amplifiers, drive and control circuits for the motors, solenoid control electronics and receive/send logic signal electronics. The interface assembly provides the audio paths and logic signal interface between the main circuit card assembly and the tape decks. The main circuit card provides overall logic control, by an 8-bit microprocessor and final amplification of the audio signals. A special track arrangement is used to record the six cassettes. They are recorded in pairs, identified 1A/1B, 2A/2B and 3A/3B, so that the first half of the program on each track is on cassette A and the second half on cassette B.

This card is also equipped with a dual in-line package (DIP) switch, accessible when the bottom cover of the reproducer is removed. The DIP switch contains four single-throw switch elements. In the ON position, switch element 1 enables extended play for tape decks 3A and 3B. Switch elements 2, 3 and 4 disable tape decks 1A/1B, 2A/2B and 3A/3B respectively when in the OFF position. The reproducer is also capable of feeding the audio output from cassette pair 3A/3B, to the PA system amplifier for broadcasting as boarding music over the PA loudspeakers. The ON/OFF switching and control of the music is from the attendant control panel 11MK. On each side of the reproducer is a hinged door which opens downwards to give access to the tape decks for loading the cassettes into the reproducer.

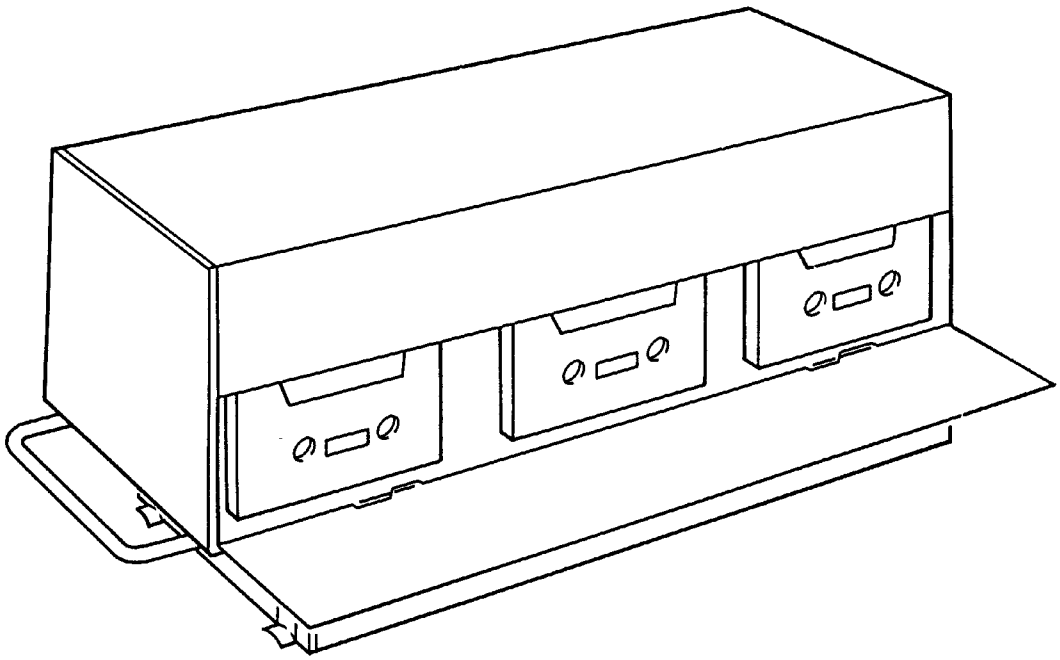
(Ref. Fig. 006)
(Ref. Fig. 007)
(Ref. Fig. 008)

B. Multiplexer

The main multiplexer consists of one main multiplexer section and three zone multiplexer sections. There are three modes of multiplexer operation: Normal, PA Override and Self-test. They are described below.

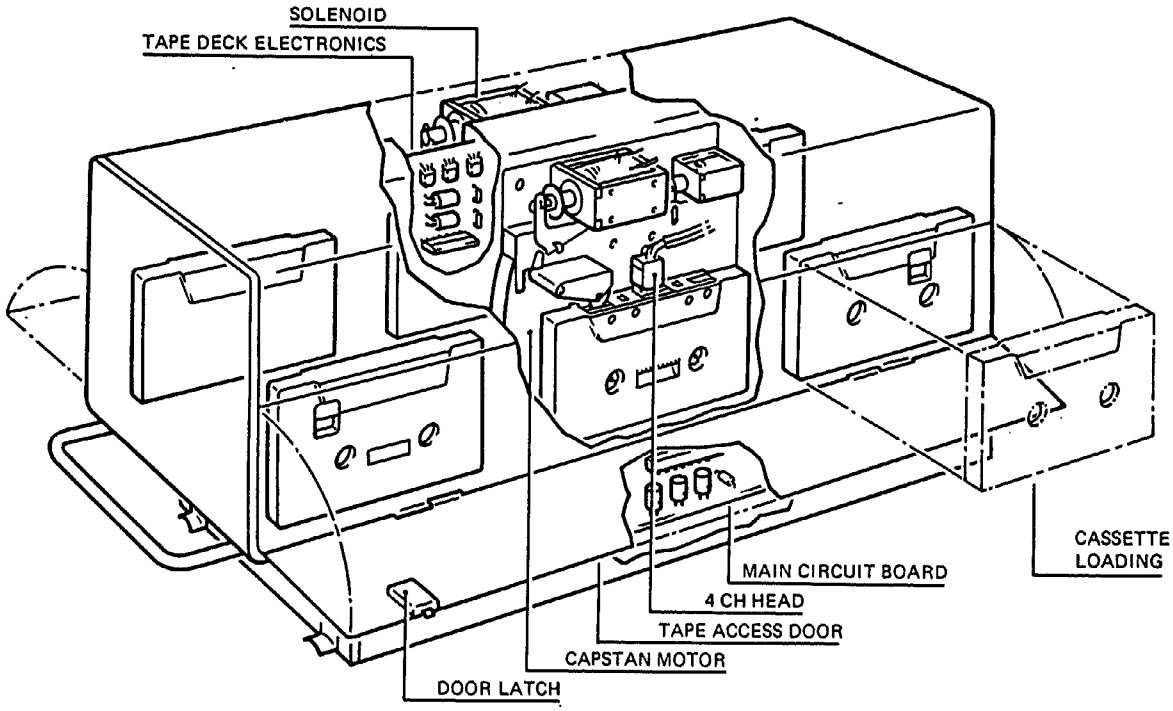
(1) Normal Mode

The main multiplexer section accepts and multiplexes 10 channels of main audio (audio common to the three zones) and feeds this multiplexed audio data to the zone multiplexer sections. Each zone multiplexer section adds four channels of audio to the 10-channel audio data from the main multi-

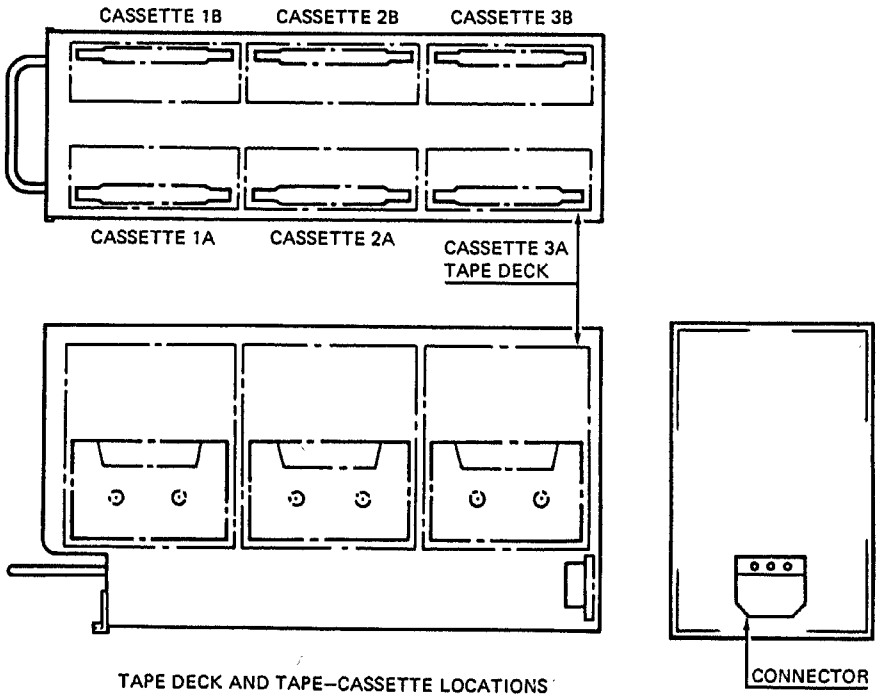


BM6 23 33 00 0 BJCO 00

Passenger Entertainment (Music) Tape Reproducer
Figure 006



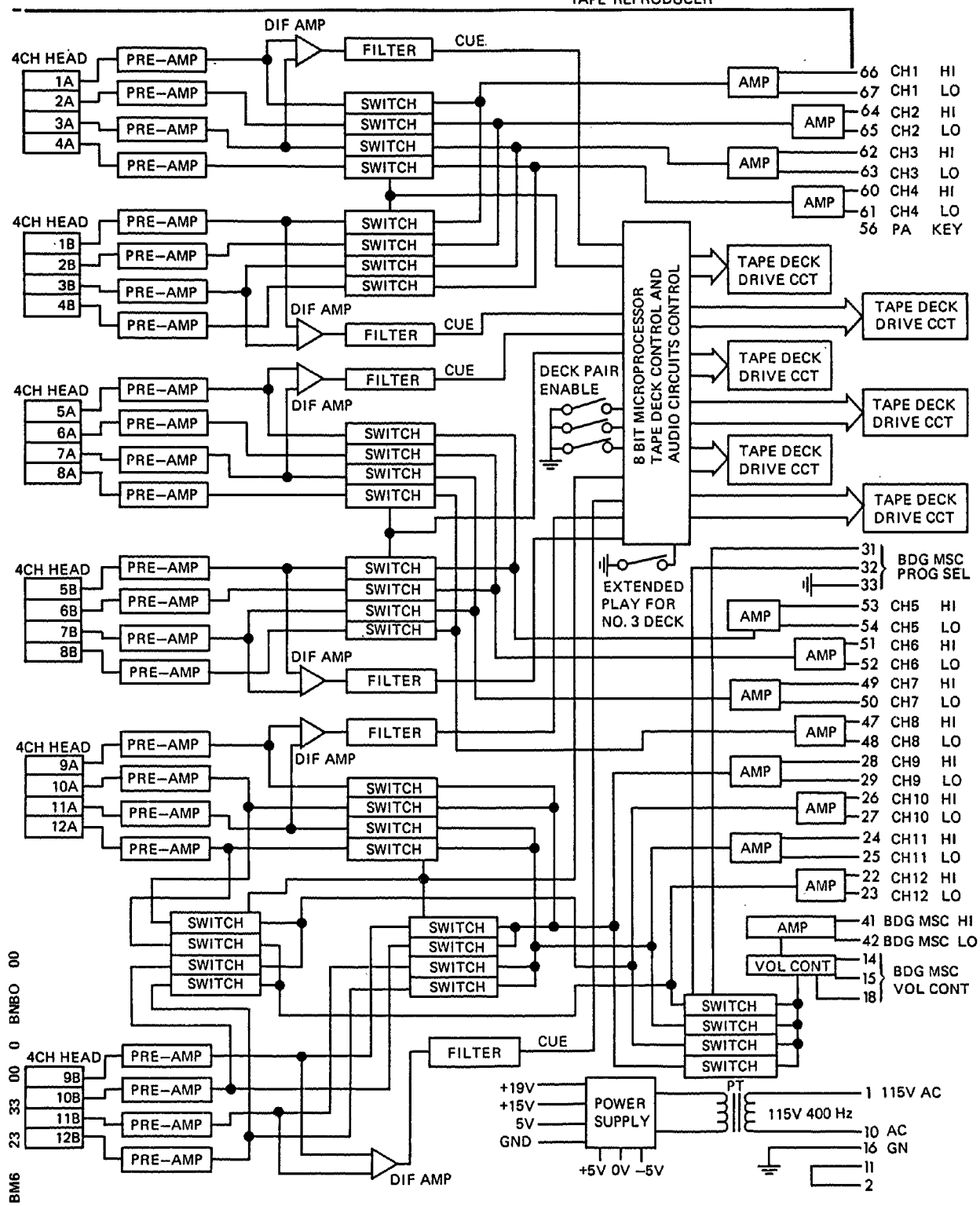

CUT–AWAY VIEW OF TAPE REPRODUCER




TAPE DECK AND TAPE–CASSETTE LOCATIONS

BM6 23 33 00 0 BLCO 00

Passenger Entertainment (Music) Tape Reproducer
Loading/Unloading
Figure 007



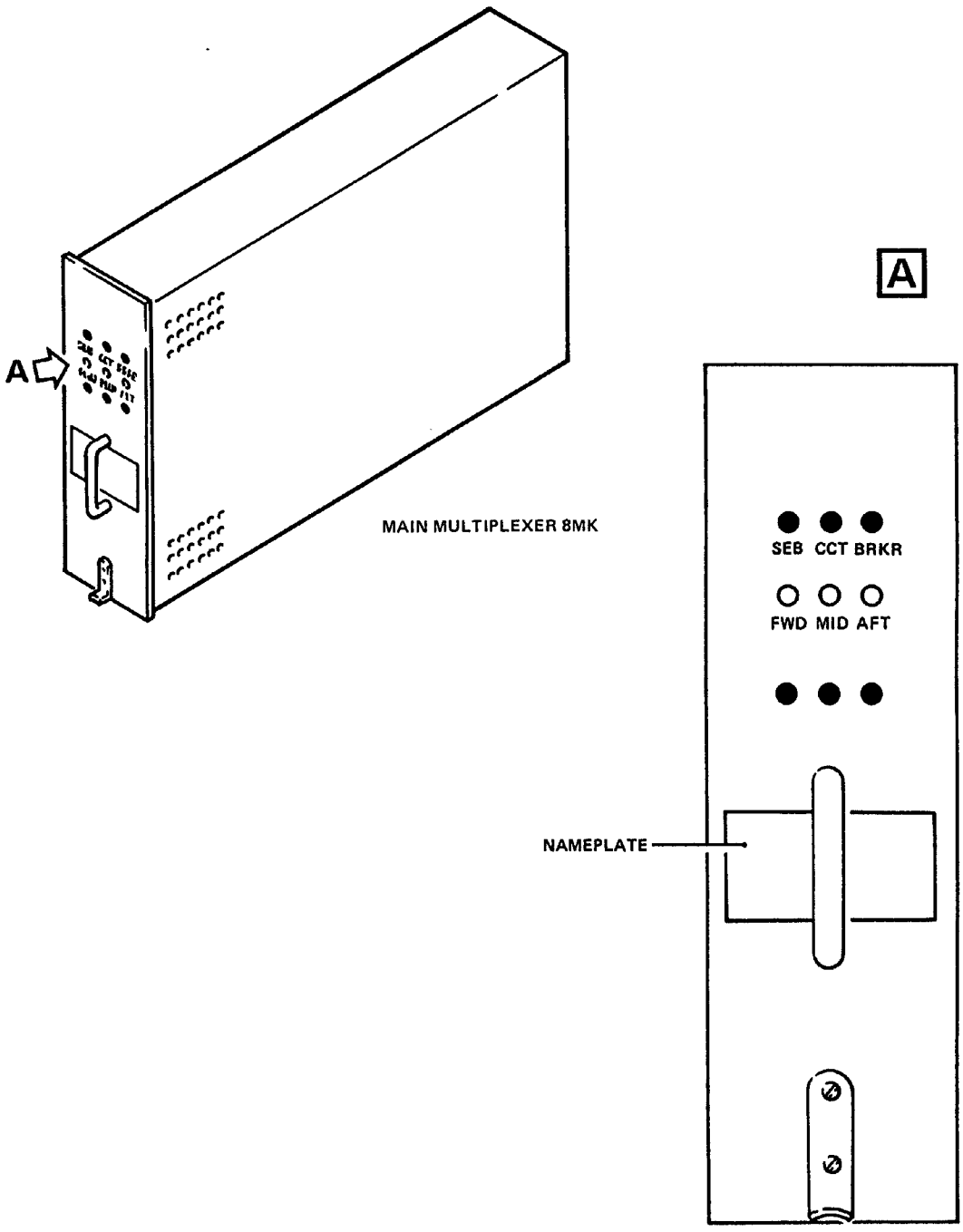

Passenger Entertainment (Music) Tape Reproducer
Schematic
Figure 008

plexer section and provides 14-channel multiplexed audio data to a zone it covers.
Of the four channels of audio which the zone multiplexer section adds, two channels are zone audio (movie/video audio specific to a zone it covers) and the other two channels are main audio.
The 14 channels of audio are delta-modulated (sampling and analog-to-digital conversion) and Manchester-coded before being multiplexed into a single signal stream and transmitted to the zone via a single shielded twisted-pair cable line. In each zone, seat electronic boxes receive the signal stream, demultiplex it according to the channel data from passenger control units (one/seat), demodulate the audio data into analog audio, and feed audio to the passenger control units.
Stereo channel pairs are programmed with a 7-element stereo tag switch (DIP switch) provided inside the main multiplexer.

(2)PA Override Mode
The PA override mode occurs on an individual zone basis, and is activated for a zone by the associated zone multiplexer section when the PA keyline for that zone is grounded externally to signal that zone multiplexer section. The PA audio is received in place of zone 1 audio, delta-modulated and placed in each channel position of the associated zone output signal stream. This mode is essentially the same as the normal mode, except that system channels 1 to 14 carry the same PA audio and the zone multiplexer section rewrites the stereo/monaural programming information portion of the command data to be all monaural.
Floating the zone PA keyline from ground returns the zone to the normal mode of operation.

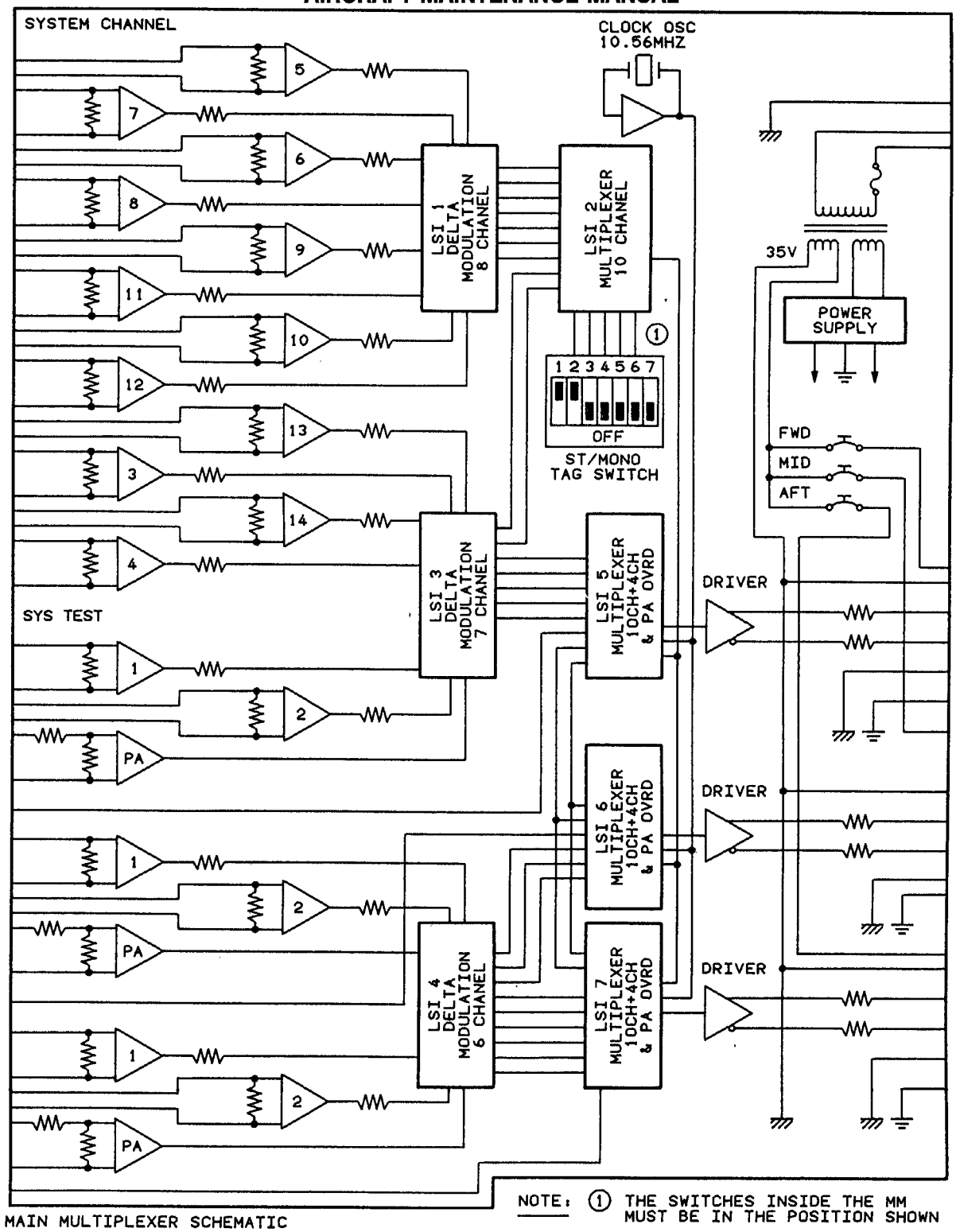
(3)Self-test Mode
The self-test mode is a mode to test the entire system over the three zones. It is activated when the system test keyline is grounded externally to signal the main multiplexer section. A 400 Hz square-wave test signal of the 400 Hz AC supply is applied to all audio inputs, inhibiting all audio from external sources. An exception is system channel 14 (main 10) audio input which receives a steady-state DC signal. This is to check the system signal path for noise-free condition. The test signal is delta-modulated in the individual channels and multiplexed. All channels are tested as monaural channels. The test is automatically done by checking the final audio output on each system channel at the receiver ends. The test results are also indicated at the receiver ends.
Floating the system test keyline from ground returns the entire system to the normal mode of operation.
(Ref. Fig. 009)
(Ref. Fig. 010)

C. Attendant Control Unit
The control unit is equipped with a system power ON/OFF switch 11MK (PES ON/OFF), a system test switch 13MK (PES TEST), and a tape reproducer test switch 12MK (T/R TEST).
The switch caps light up when they are activated, by an internal lamp.
With the engines running (oil pressure high), the complete multiplex (PES) can be switched on with switch 11MK (PES ON/OFF). However when the engines are not running, the tape reproducer test switch 12MK (T/R TEST)




BM6 23 33 00 0 BPAO 00

Passenger Entertainment (Music)
Main Multiplexer
Figure 009




B M 6 23 33 00 0 BREO 00

MAIN MULTIPLEXER SCHEMATIC

Passenger Entertainment (Music)
Main Multiplexer - Schematic
Figure 010

overrides the stop signal for the tape reproducer. The test switch 13MK (PES TEST) activates PES Bite.

D. Seat Electronic Box

The basic function of the SEB is to receive encoded and multiplexed data from the Main Multiplexer, to decode this data and provide an audio output. Fourteen (14) of the digital and time divided multiplexed data signals from the Main Multiplexer are accepted, together with channel selected signals from up to four Passenger Control Units (PCU), in the form of a DC Voltage, dependent on the switch selection of one of twelve resistor values, that are common to ground on one end.
The output signal consists of a left and right audio output per seat, which may be either stereo or monaural.
(Ref. Fig. 011)
(Ref. Fig. 012)

E. Passenger Control Unit

The passenger control unit is equipped with the following:
- a channel keyboard which enables the selection of any one of the 12 audio entertainment channels. The channel selected is displayed on a LED display next to the keyboard.
- a volume keyboard which allows the audio entertainment output level to be set.
- a headset connector which enables the passenger to hear the selected program via an electric or pneumatic headset.

(Ref. Fig. 013)

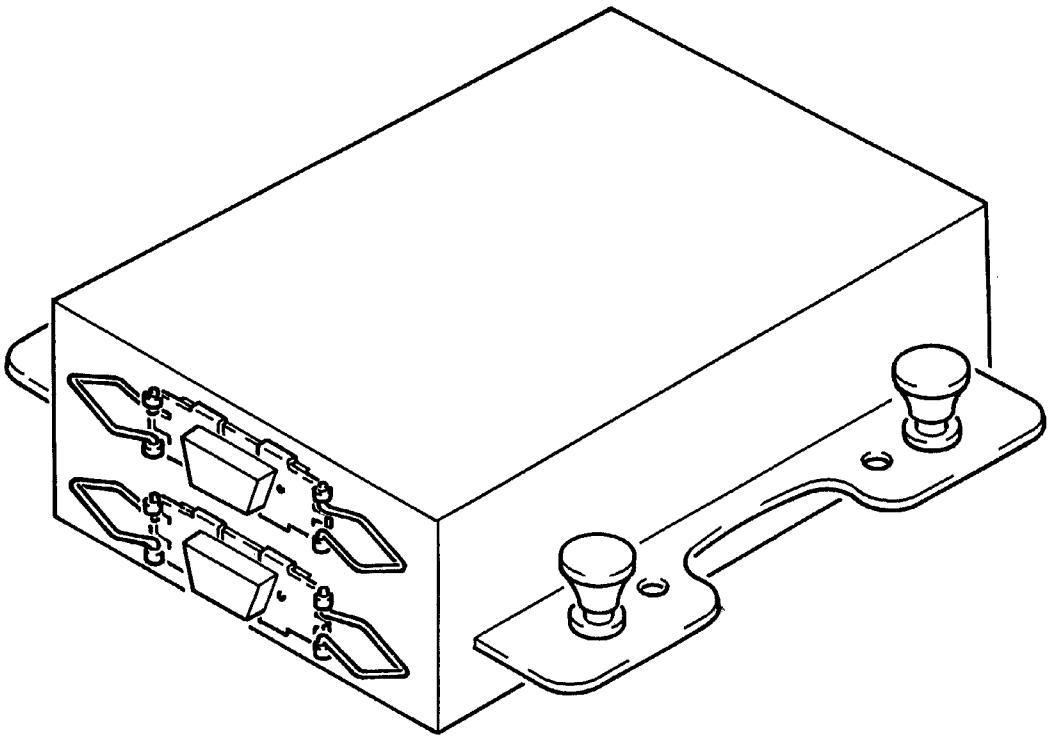
6. System Operation

A. Cassette Loading

Access to the tape decks is gained by unlatching and opening the hinged doors on each side of the reproducer. Cassettes are loaded in accordance with the cassette number shown on the inside of each door and the background colors of the cassette labels.
The background colors are a guide to the correct pairing of the cassettes and are as follows:

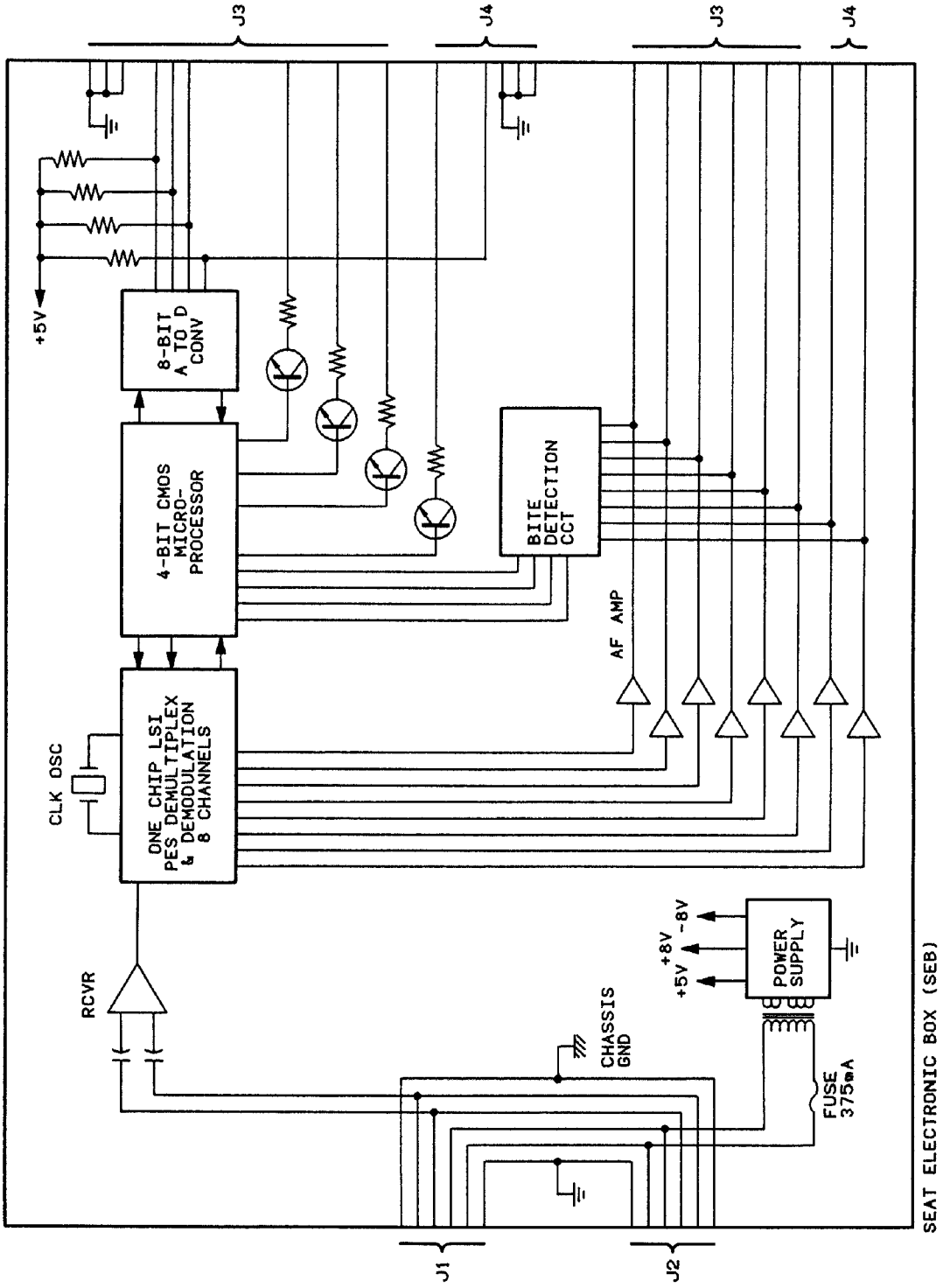
| Color | Cassette No. | |
|---|---|---|
| Solid red | 1A | No. 1 Program pair |
| Red stripes | 1B | |
| Solid yellow | 2A | No. 2 Program pair |
| Yellow stripes | 2B | |
| Solid blue | 3A | No. 3 Program pair |
| Blue stripes | 3B | |

The cassettes are aligned with the tape deck shafts, their respective numbers facing outwards, and pushed into the cassette cartridge. A contour of the correct cassette orientation is shown on the tape deck.
The access door must be closed and latched when the six cassettes are loaded.



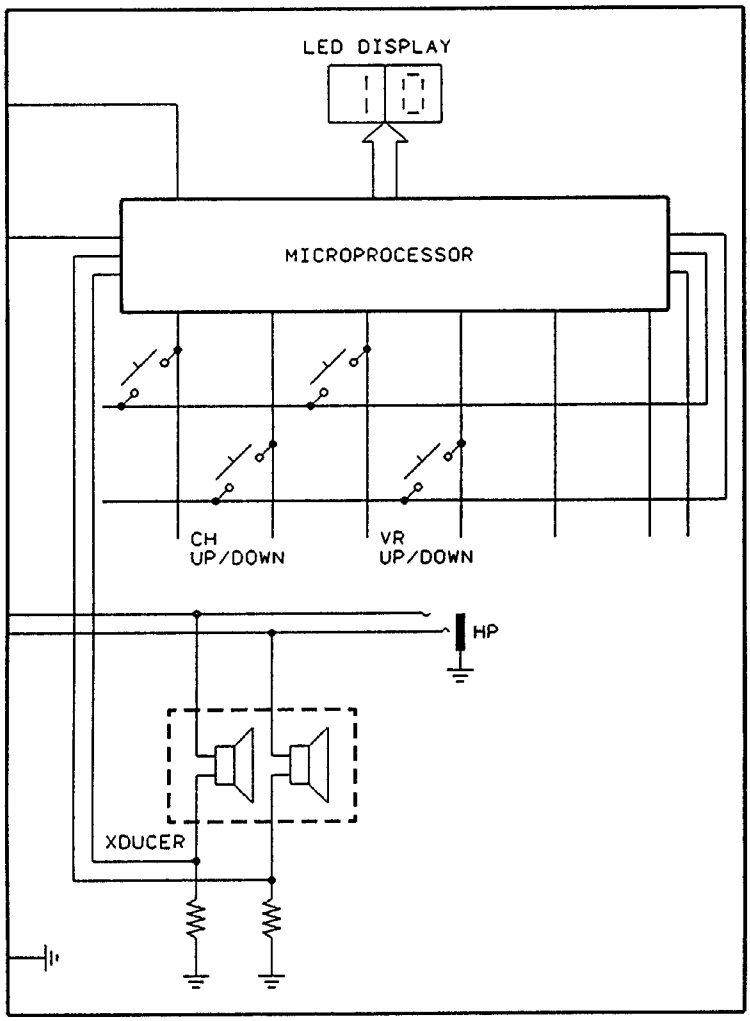
BM6 23 33 00 0 BTAO 00

Passenger Entertainment (Music)
Seat Electronic Box (SEB)
Figure 011

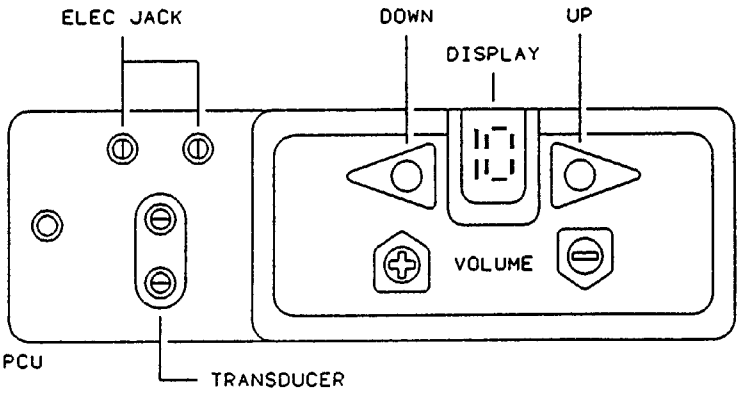



B M 6 23 33 00 0 BVA0 00

Passenger Entertainment (Music)
Seat Electronic Box (SEB)
Figure 012




DIGITAL PASSENGER CONTROL UNIT




B M 6 23 33 00 0 BXH0 00

Passenger Entertainment (Music)
Passenger Control Unit
Figure 013

B. Energization
When busbar 110XP-C and 102PP are energized and circuit breakers 21MK and 22MK are closed, 115 V AC and 28 V DC are supplied to relay 807MK.
Relay 807MK is energized when the PES ON/OFF switch 11MK is pressed ON to supply 115 V AC to the tape reproducer and power amplifier and 28 V DC to the integral light in the switch.

C. Program Selection
Individual selection and volume control of the entertainment programs stored on the cassette is made at the passenger control unit.
The accompanying sound from the passenger entertainment video programs can also be selected at the control unit.
The channel arrangement on the control unit is as follows:

| T/R Channel | Track (A) | Track (B) | PCU Channel | Contents |
|---|---|---|---|---|
| 1 | 1 | 1 | 1L | Entertainment Music (Stereo) |
| 2 | 2 | 2 | 2L | Entertainment Music (Stereo) |
| 3 | 3 | 3 | 1R | Entertainment Music (Mono) |
| 4 | 4 | 4 | 2R | Entertainment Music (Mono) |
| 5 | 5 | 5 | 3 | Entertainment Music (Mono) |
| 7 | 7 | 7 | 4 | Entertainment Music (Mono) |
| 6 | 6 | 6 | 5 | Entertainment Music (Mono) |
| 8 | 8 | 8 | 6 | Entertainment Music (Mono) |
| 9 | 9 | 9 | 7 | Entertainemnt Music (Mono) |
| 11 | 11 | 11 | 8 | Entertainment Music (Mono) |
| | - | - | 9 | Entertainment Video (Stereo) |
| | - | - | 10 | Entertainment Video (Stereo) |

The selected channel program can be heard over the headset connected to the passenger control unit.

D. Priority Announcement
During an announcement from the flight crew or the announcement/music tape reproducer system, the Main Multiplexer key lines are grounded.
The announcement is fed via the passenger address amplifier to the main multiplexer announce-override curcuits, causing the audio signal on all channels to be simultaneously overridden for the duration of the announcement in the respective zones.

E. Video Sound Selection
Two channels of video sound are applied to each zone, when the Passenger Entertainment Video System is activated.
When channel 9 or 10 is selected, the video sound can be heard over a headset connected to the Passenger Control Unit (PCU).

# PASSENGER ENTERTAINMENT (MUSIC)
# DESCRIPTION AND OPERATION

## 1. GENERAL

A. Passenger Entertainment (Music) (PES)
The passenger entertainment (music) provides pre-recorded audio entertainment programs for the passengers. Programs can be individually selected and is audible over a headset, connected to the passenger control unit mounted in the seat armrest.

B. Passenger Service System (PSS)
The passenger service system is designed to provide remote control for reading and attendant call lights via the passenger control units in the passenger compartment.

## 2. Component Location

(Ref. Fig. 001)

R **ON A/C 101-104,

(Ref. Fig. 002)

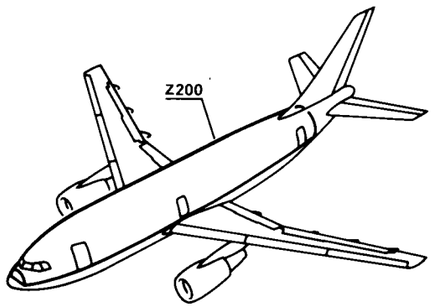
R **ON A/C 105-200,

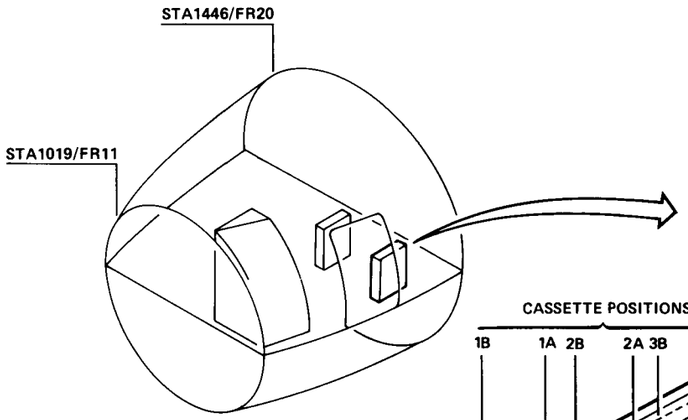
R (Ref. Fig. 003)

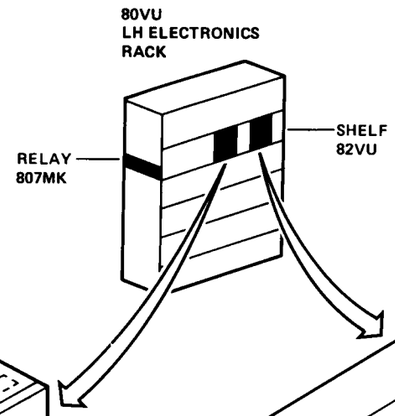
R **ON A/C 101-200,

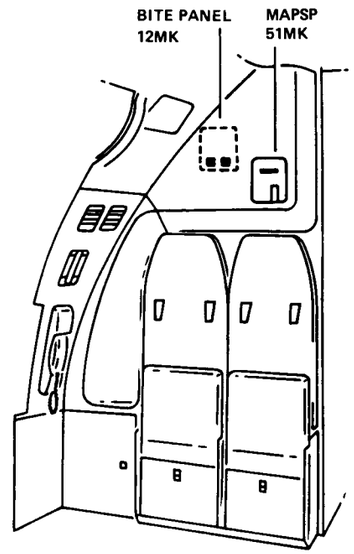
| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 7MK | TRAY FOR MAIN MULTIPLEXER | 82VU | 121 | 121BL | |
| 8MK | MULTIPLEXER - MAIN | 82VU | 121 | 121BL | 23-33-15 |
| 9MK | TRAY FOR AUDIO REPRODUCER | 82VU | 121 | 121BL | |
| 10MK | REPRODUCER - AUDIO | 82VU | 121 | 121BL | 23-33-12 |
| 12MK | PANEL - BITE | | 221 | | 23-33-17 |
| 50MK | UNIT - ZONE CONTROL | | 100 | | 23-33-18 |
| 51MK | PANEL - MASTER ATTENDANT PASSENGER SERVICE | | 221 | | 23-33-19 |
| 80MK | BOX - FLOOR DISCONNECT | | 100 | | 23-33-16 |
| 90MK | DIODE | | 200 | | |
| 91MK | DIODE | | 200 | | |
| 92MK | DIODE | | 200 | | |
| 93MK | DIODE | | 200 | | |
| 100MK | BOX - SEAT ELECTRONIC | | 100 | | 23-33-21 |
| 180MK | TERMINATOR - SEAT ELECTRONIC BOX | | 100 | | |
| 181MK | TERMINATOR - FLOOR DISCONNECT BOX | | 200 | | |
| 182MK | TERMINATOR - ZONE CONTROL UNIT | | 100 | | |
| 200MK | UNIT - PASSENGER CONTROL | | 200 | | 23-33-22 |
| 201MK | UNIT - PASSENGER CONTROL | | 200 | | 23-33-22 |
| 202MK | UNIT - PASSENGER CONTROL | | 200 | | 23-33-22 |

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 203MK | UNIT - PASSENGER CONTROL | | 200 | | 23-33-22 |
| 210MK | TRANSDUCER - REMOTE | | 200 | | |
| 807MK | RELAY - CONTROL MUSIC ON | 82VU | 121 | 121BL | |



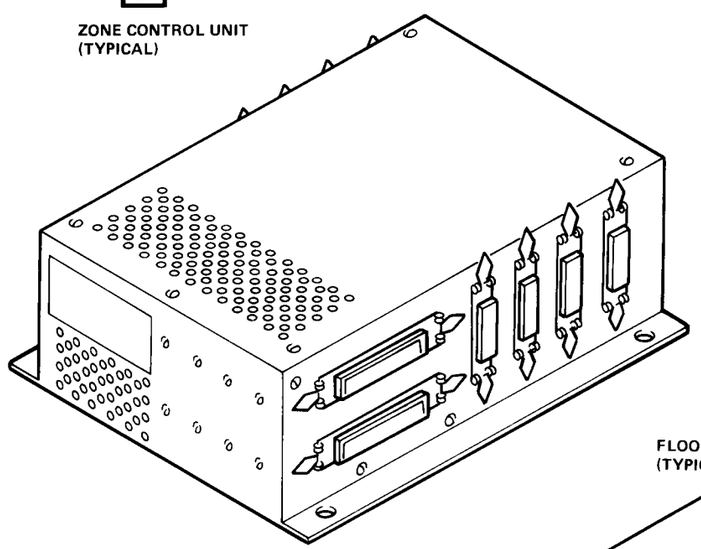



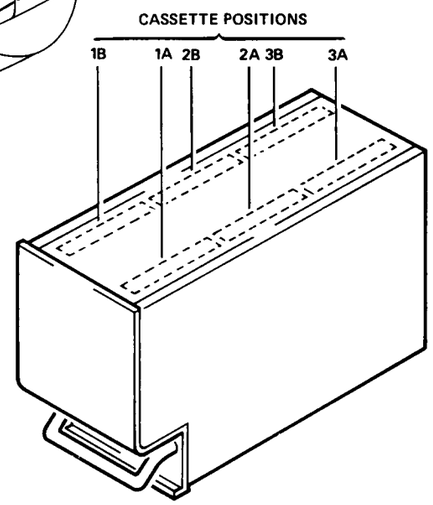




PURSER STATION

B

ZONE CONTROL UNIT
(TYPICAL)

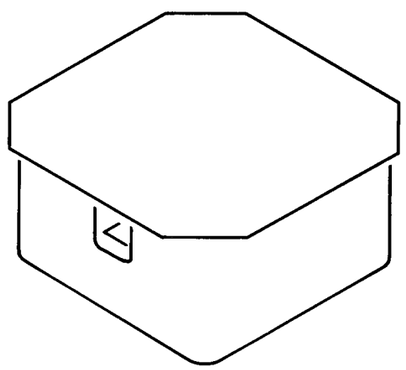


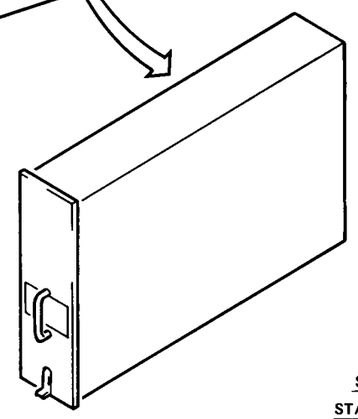



10MK
AUDIO REPRODUCER
9MK
TRAY FOR AUDIO REPRODUCER

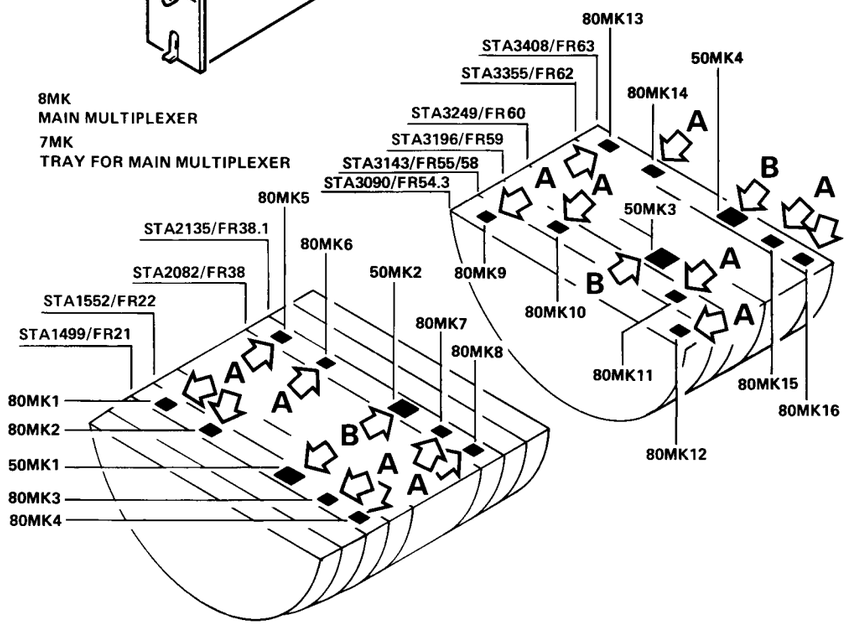
A

FLOOR DISCONNECT BOX
(TYPICAL)



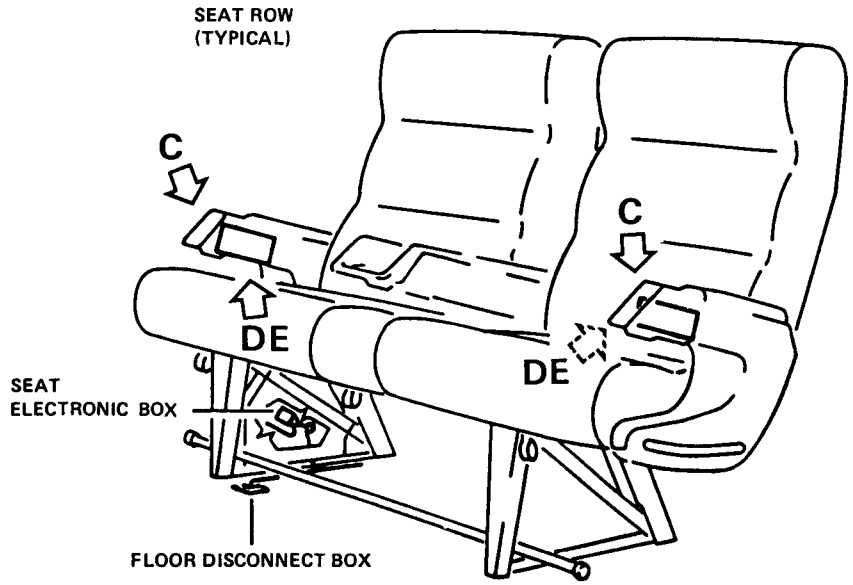


8MK
MAIN MULTIPLEXER
7MK
TRAY FOR MAIN MULTIPLEXER

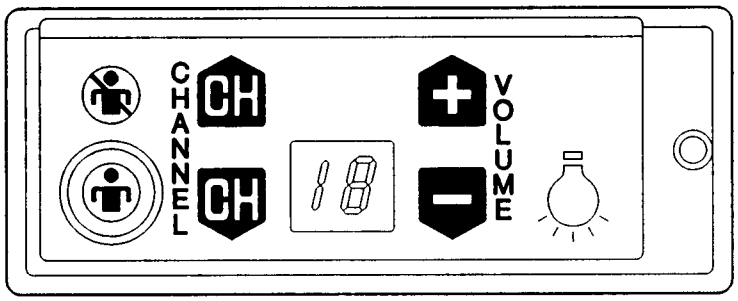



BM6 23 33 00 0 HAKA 00

Passenger Entertainment (Music)
Component Location (Sheet 1/2)
Figure 001

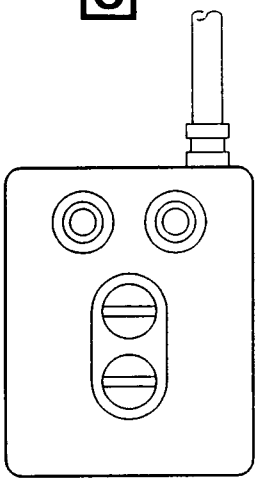



E



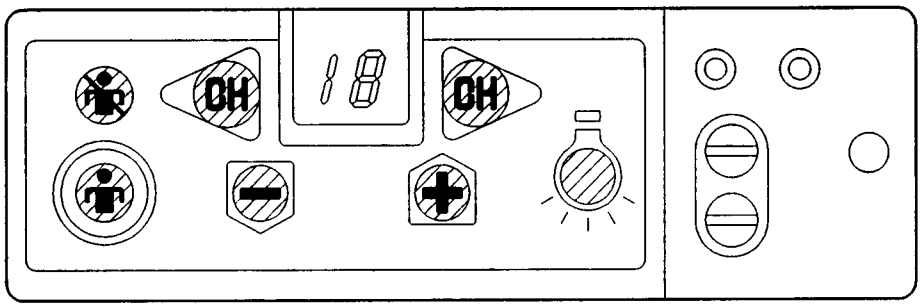

200MK PASSENGER CONTROL UNIT LH (FC, BC) SHOWN
201MK PASSENGER CONTROL UNIT RH (FC, BC) OPPOSITE

C



210MK REMOTE TRANSDUCER

D




202MK PASSENGER CONTROL UNIT LH (YC) SHOWN
203MK PASSENGER CONTROL UNIT RH (YC) OPPOSITE

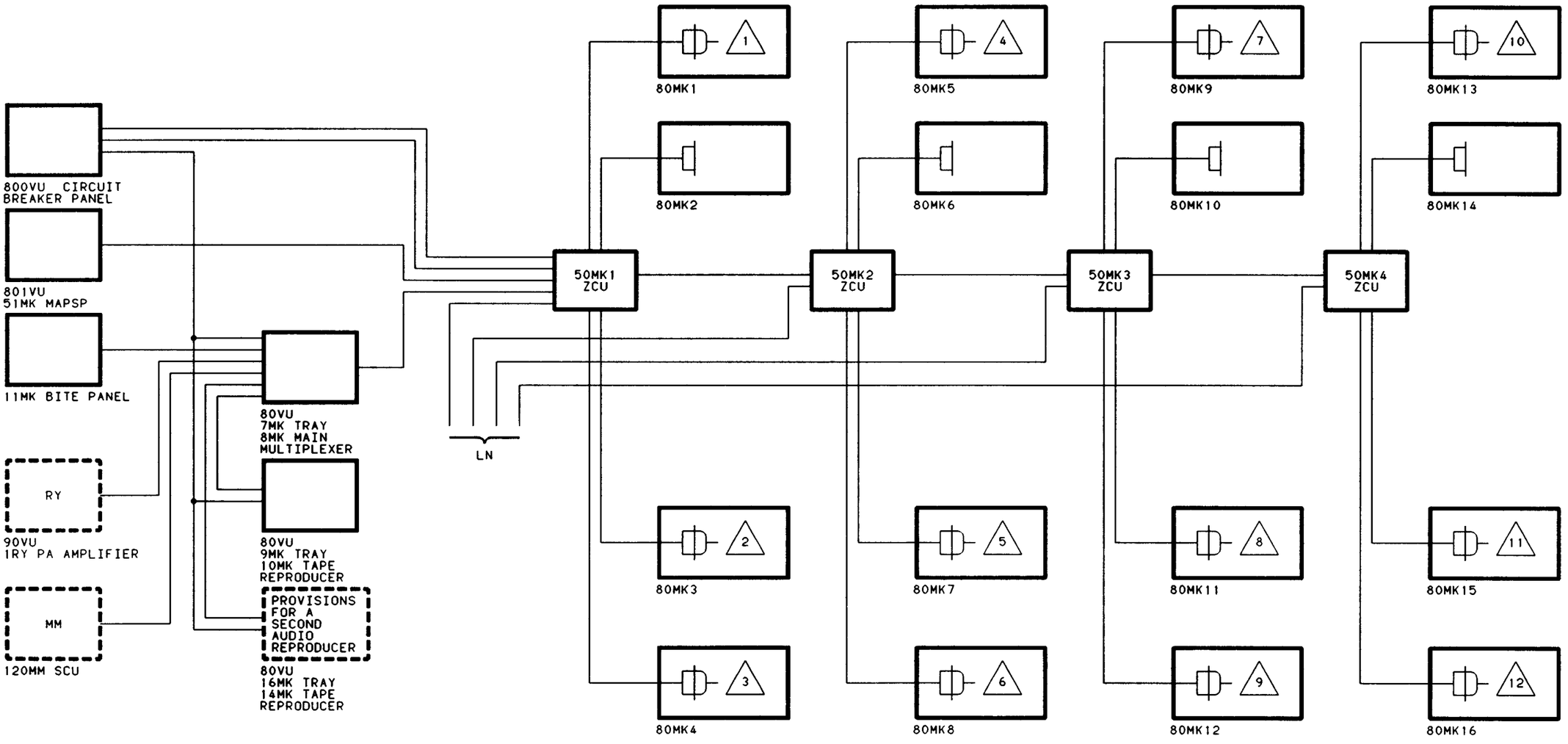
BM6 23 33 00 0 HAKM 00

Passenger Entertainment (Music)
Component Location (Sheet 2/2)
Figure 001

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NOTE

RY = 23-31-00 PASSENGER ADRESS SYSTEM
MM = 23-36-00 PASSENGER ENTERTAINMENT (VIDEO)
LN = 33-23-00 CALL SYSTEM

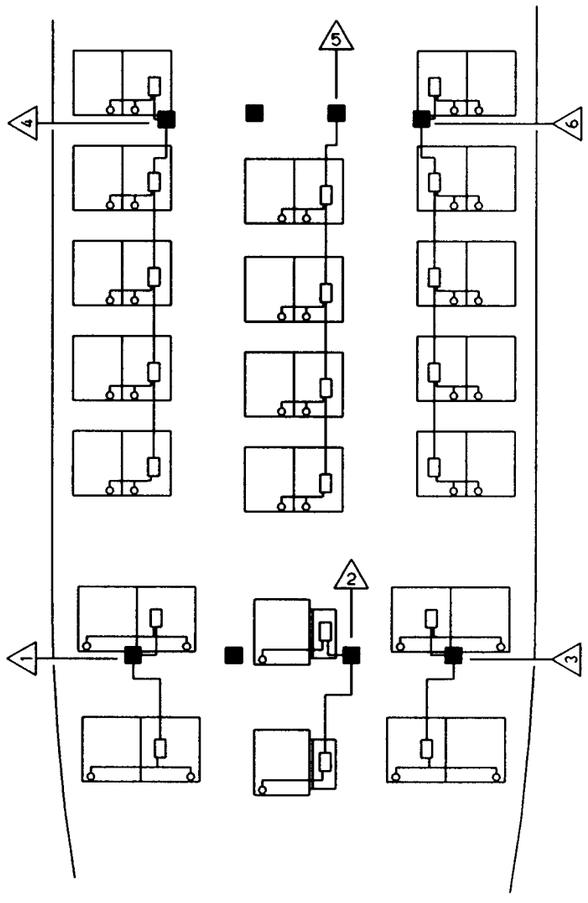
Passenger Entertainment (Music)
Seat Layout - Configuration (Sheet 1/4)
Figure 002

R EFFECTIVITY: 101-104,

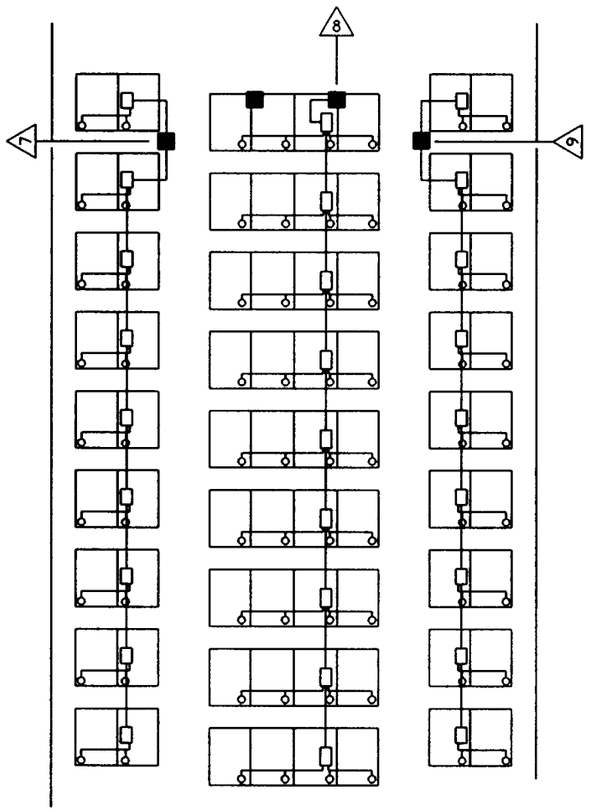
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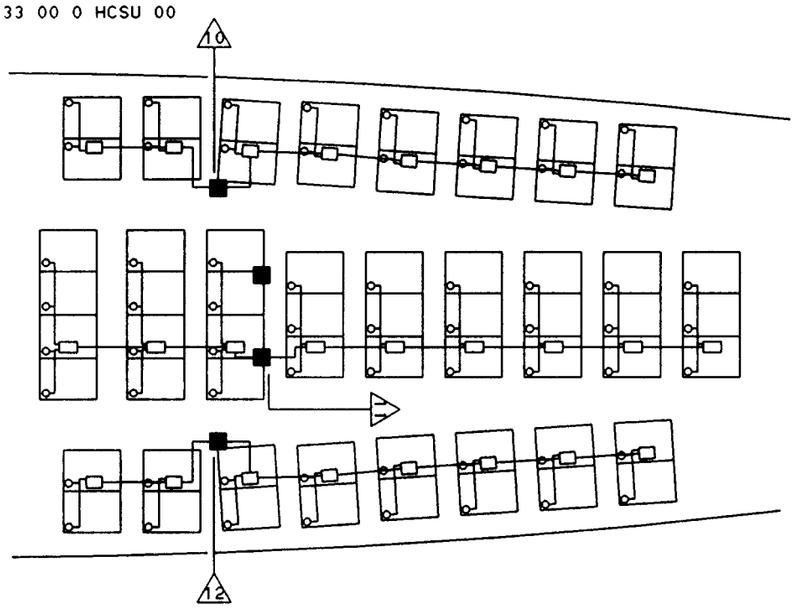



| 50MK2 | | |




| 50MK3 | | |

B M 6 23 33 00 0 HCSU 00



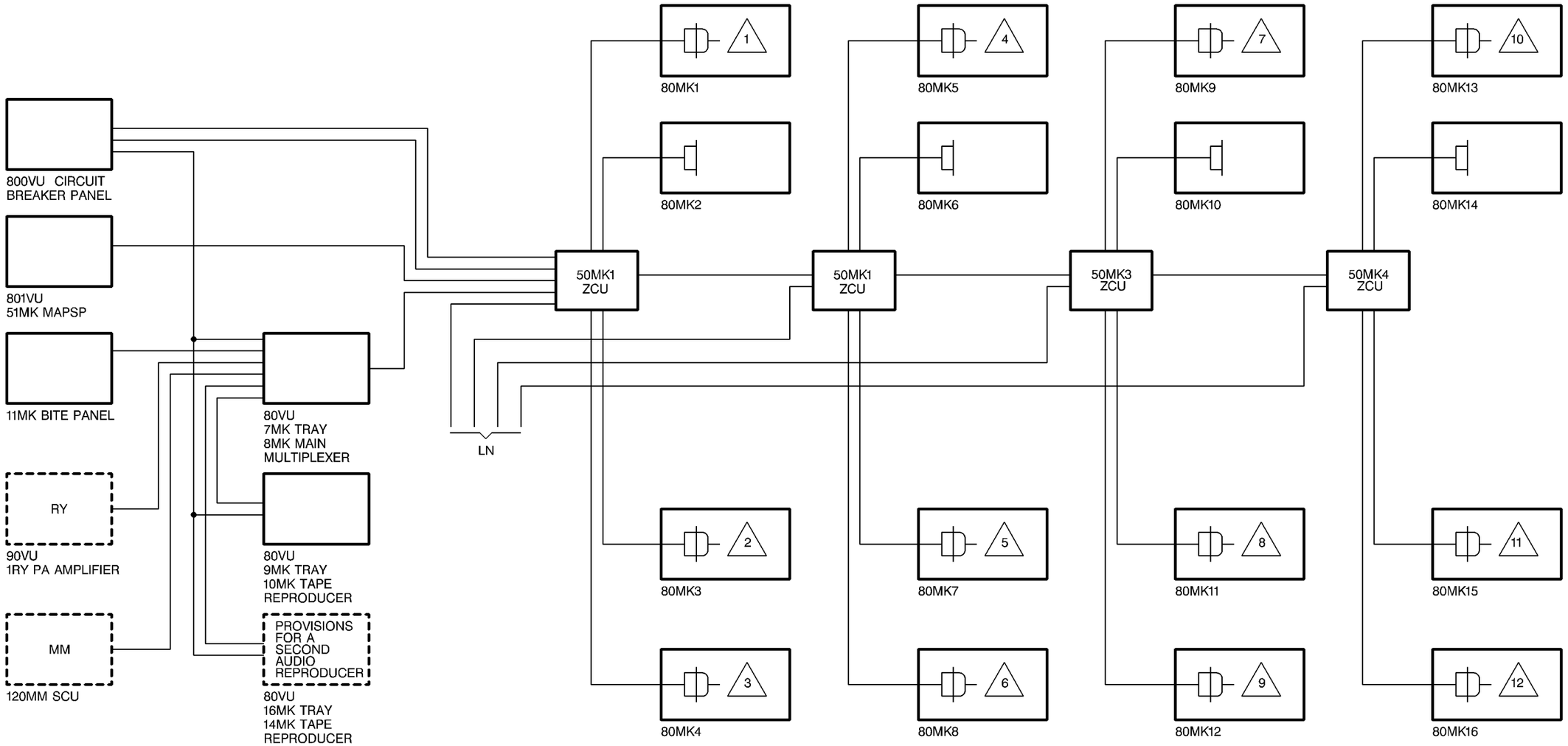

Passenger Entertainment (Music)
Seat Layout - Configuration (Sheet 4/4)
Figure 002

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | 50MK4 | | | | |
| | | 80MK13 | | | | | |
| | | 154MK8 | 154MK9 | | | | |
| 151MK10 | | | 151MK11 | 12 | 13 | 14 | 15 |
| 100MK17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | | | | | | | |
| 135MK9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 203MK9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 203MK25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| | | | | | | | |
| 180MK14 | | | | | | | 180MK15 |
| 210MK9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 210MK25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | 80MK14 | | | | | |
| 181MK7 | | 181MK8 | 181MK9 | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 151MK24 | 25 | | 151MK26 | 27 | 28 | 29 | 30 | |
| | | | | | | | | |
| 100MK40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 137MK10 | 11 | 12 | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 133MK10 | 11 | 12 | 141MK1 | 143MK1 | 2 | 3 | 4 | 5 |
| 202MK9 | 10 | 11 | 200MK20 | 202MK12 | 13 | 14 | 15 | 16 |
| 202MK25 | 26 | 27 | 200MK22 | 202MK28 | 29 | 30 | 31 | 32 |
| 202MK41 | 42 | 43 | 200MK24 | 202MK44 | 45 | 46 | 47 | 48 |
| 202MK57 | 58 | 59 | | | | | | |
| 210MK41 | 42 | 43 | | 210MK44 | 45 | 46 | 47 | 48 |
| 210MK57 | 58 | 59 | | 210MK60 | 61 | 62 | 63 | 64 |
| 210MK73 | 74 | 75 | | 210MK76 | 77 | 78 | 79 | 80 |
| 210MK89 | 90 | 91 | | | | | | |
| | | 154MK11 | 151MK31 | | | | | |
| | | | 80MK15 | | | | | |
| | | | | | | | | |
| 180MK17 | | | | | | | | 180MK18 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 80MK16 | | | | | |
| | | 154MK14 | 154MK15 | | | | |
| 151MK39 | | | 151MK40 | 41 | 42 | 43 | 44 |
| 100MK65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 |
| 133MK21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| | | | | | | | |
| 202MK68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 |
| 202MK84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 |
| | | | | | | | |
| 180MK21 | | | | | | | 180MK22 |
| 210MK100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 |
| 210MK116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 |

| | |
|---|---|
| SEATS RH | FLOOR DISTRIBUTION BOX |
| | FD |
| | CA FD-SEB |
| | CA SEB-SEB |
| | SEB |
| | CA SEB-PCU |
| | CA SEB-PCU |
| | PCU |
| | PCU |
| | TERMINATOR FOR FD |
| | TERMINATOR FOR SEB |
| | TRANSDUCER |
| | TRANSDUCER |
| SEATS CENTER | |
| | FD |
| | TERMINATOR FOR FD |
| | TERMINATOR FOR SEB |
| | CA FD-SEB |
| | CA SEB-SEB |
| | CA SEB-SEB |
| | SEB |
| | SEB |
| | CA SEB-PCU |
| | CA SEB-PCU |
| | ADAPTER CABLE |
| | CA SEB-PCU |
| | PCU |
| | PCU |
| | PCU |
| | PCU |
| | TRANSDUCER |
| | TRANSDUCER |
| | TRANSDUCER |
| | TRANSDUCER |
| SEATS LH | CA FD-SEB |
| | FD |
| | TERMINATOR FOR FD |
| | TERMINATOR FOR SEB |
| | |
| | FD |
| | CA FD-SEB |
| | CA SEB-SEB |
| | SEB |
| | CA SEB-PCU |
| | CA SEB-PCU |
| | PCU |
| | PCU |
| | TERMINATOR FOR FD |
| | TERMINATOR FOR SEB |
| | TRANSDUCER |
| | TRANSDUCER |




BM6 23 33 00 0 HDCA 00

NOTE:

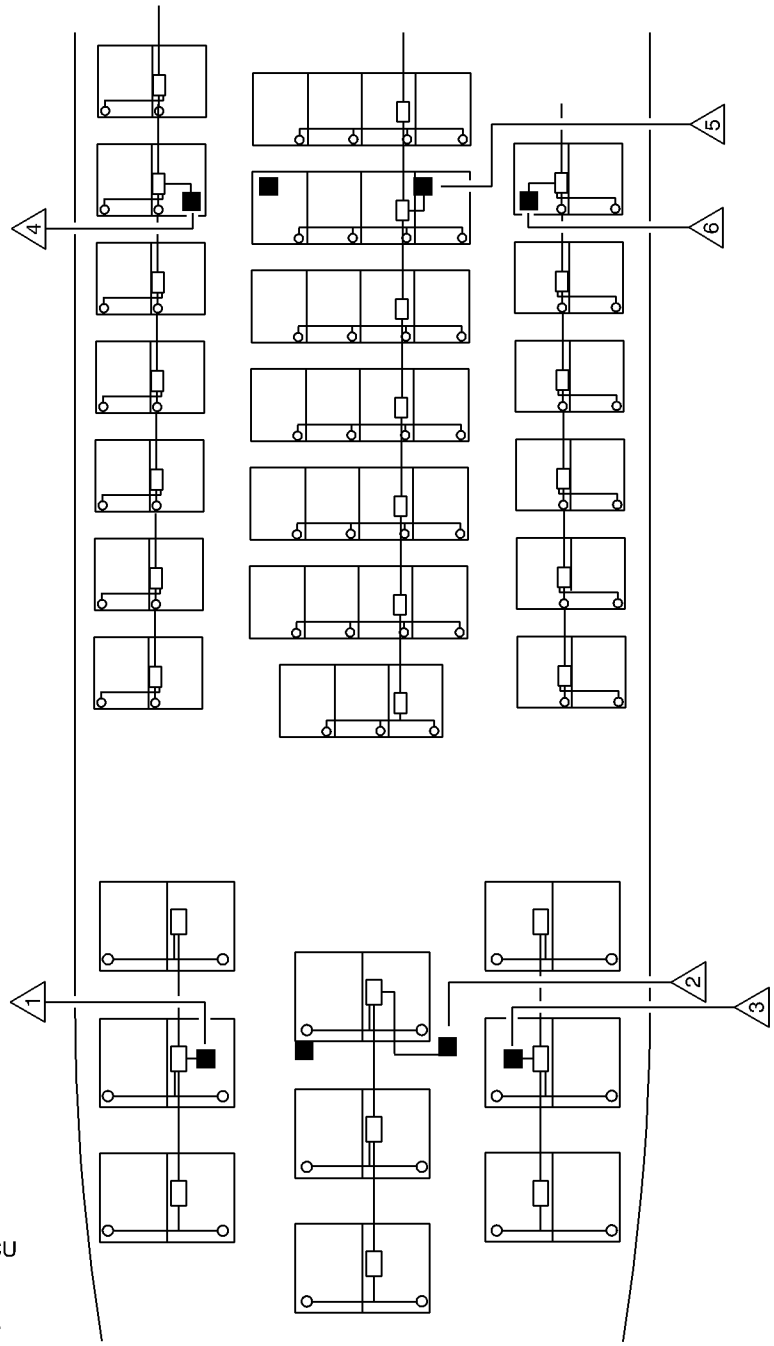
RY = 23-31-00 PASSENGER ADRESS SYSTEM
MM = 23-36-00 PASSENGER ENTERTAINMENT (VIDEO)
LN = 33-23-00 CALL SYSTEM

Passenger Entertainment (Music)
Seat Layout - Configuration (Sheet 1/4)
Figure 003

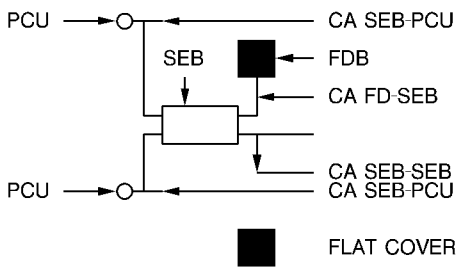
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R EFFECTIVITY: 105-200,

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NOTE:




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Passenger Entertainment (Music)
Seat Layout - Configuration (Sheet 2/4)
Figure 003

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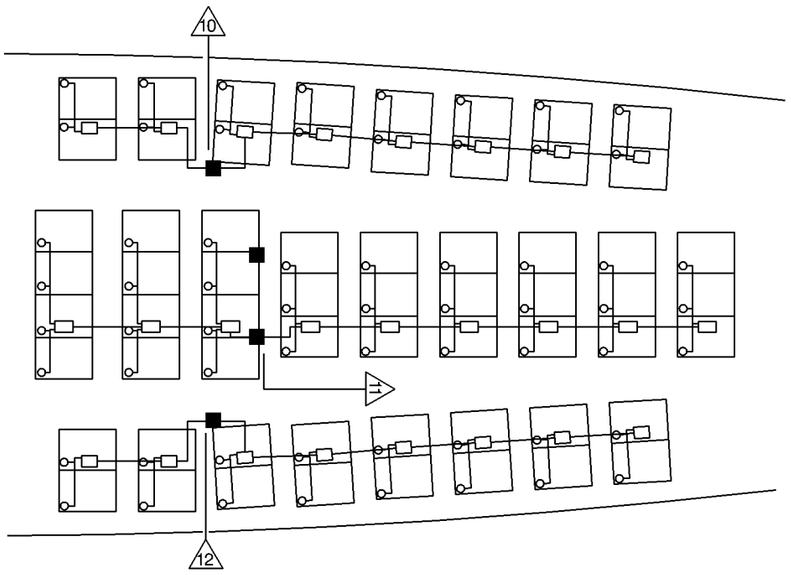
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| 50MK3 | | |

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R EFFECTIVITY: 105-200,

Passenger Entertainment (Music)
Seat Layout - Configuration (Sheet 4/4)
Figure 003

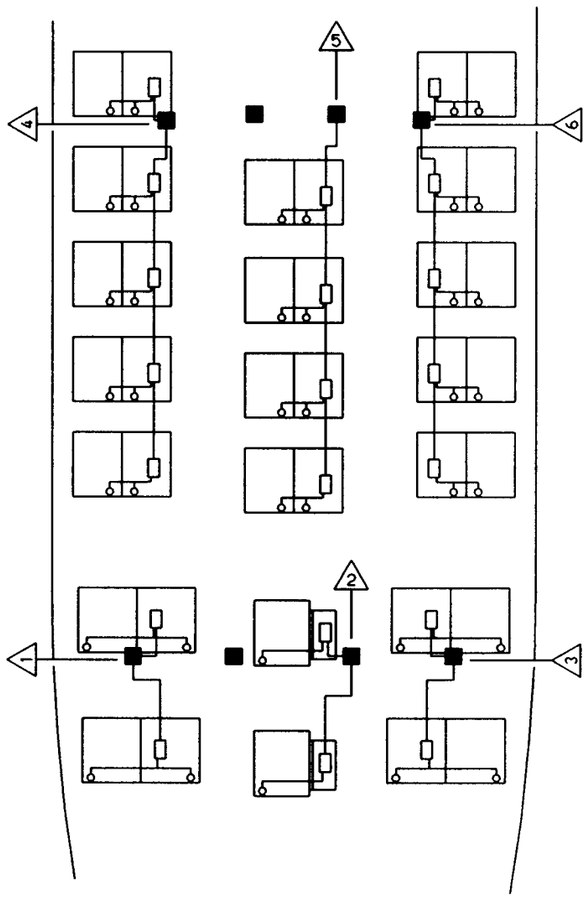



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 50MK4 | | | | | | | |
| | | 80MK13 | | | | | |
| | | 154MK8 | 154MK9 | | | | |
| 151MK10 | | | 151MK11 | 12 | 13 | 14 | 15 |
| 100MK17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | | | | | | | |
| 135MK9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 203MK9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 203MK25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| | | | | | | | |
| 180MK14 | | | | | | | 180MK15 |
| 210MK9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 210MK25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |

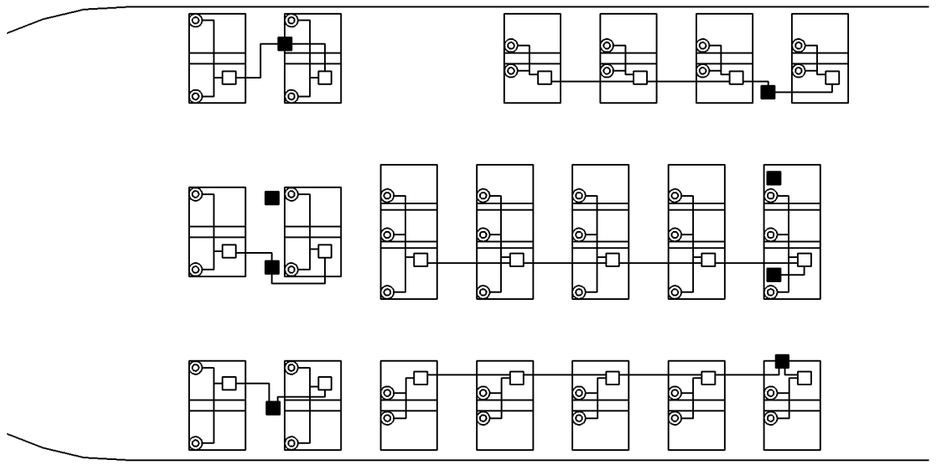
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | 80MK14 | | | | | |
| 181MK7 | | 181MK8 | 181MK9 | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 151MK24 | 25 | | 151MK26 | 27 | 28 | 29 | 30 | |
| | | | | | | | | |
| 100MK40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 137MK10 | 11 | 12 | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 133MK10 | 11 | 12 | 141MK1 | 143MK1 | 2 | 3 | 4 | 5 |
| 202MK9 | 10 | 11 | 200MK20 | 202MK12 | 13 | 14 | 15 | 16 |
| 202MK25 | 26 | 27 | 200MK22 | 202MK28 | 29 | 30 | 31 | 32 |
| 202MK41 | 42 | 43 | 200MK24 | 202MK44 | 45 | 46 | 47 | 48 |
| 202MK57 | 58 | 59 | | | | | | |
| 210MK41 | 42 | 43 | | 210MK44 | 45 | 46 | 47 | 48 |
| 210MK57 | 58 | 59 | | 210MK60 | 61 | 62 | 63 | 64 |
| 210MK73 | 74 | 75 | | 210MK76 | 77 | 78 | 79 | 80 |
| 210MK89 | 90 | 91 | | | | | | |
| | | 154MK11 | 151MK31 | | | | | |
| | | | 80MK15 | | | | | |
| | | | | | | | | |
| 180MK17 | | | | | | | | 180MK18 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | 80MK16 | | | | | |
| | | 154MK14 | 154MK15 | | | | |
| 151MK39 | | | 151MK40 | 41 | 42 | 43 | 44 |
| 100MK65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 |
| 133MK21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| | | | | | | | |
| 202MK68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 |
| 202MK84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 |
| | | | | | | | |
| 180MK21 | | | | | | | 180MK22 |
| 210MK100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 |
| 210MK116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 |

| | |
|---|---|
| FLOOR DISTRIBUTION BOX | SEATS RH |
| FD | |
| CA.FD-SEB | |
| CA.SEB-SEB | |
| SEB | |
| CA.SEB-PCU | |
| CA.SEB-PCU | |
| PCU | |
| PCU | |
| TERMINATOR FOR FD | |
| TERMINATOR FOR SEB | |
| TRANSDUCER | |
| TRANSDUCER | |
| | SEATS CENTER |
| FD | |
| TERMINATOR FOR FD | |
| TERMINATOR FOR SEB | |
| CA.FD-SEB | |
| CA.SEB-SEB | |
| CA.SEB-SEB | |
| SEB | |
| SEB | |
| CA.SEB-PCU | |
| CA.SEB-PCU | |
| ADAPTER CABLE | |
| CA.SEB-PCU | |
| PCU | |
| PCU | |
| PCU | |
| TRANSDUCER | |
| TRANSDUCER | |
| TRANSDUCER | |
| TRANSDUCER | |
| CA.FD-SEB | |
| FD | |
| TERMINATOR FOR FD | |
| TERMINATOR FOR SEB | |
| | SEATS LH |
| FD | |
| CA.FD-SEB | |
| CA.SEB-SEB | |
| SEB | |
| CA.SEB-PCU | |
| CA.SEB-PCU | |
| PCU | |
| PCU | |
| TERMINATOR FOR FD | |
| TERMINATOR FOR SEB | |
| TRANSDUCER | |
| TRANSDUCER | |




| 50MK2 | | |



| | FLOOR DISTRIBUTION BOX |
|---|---|
| SEATS LH | PCU |
| | CA SEB-PCU |
| | SEAT ELECTRONIC BOX |
| | TERMINATOR-SEB |
| | CA SEB-SEB |
| | FLOOR DISCONNECT BOX |
| | CA FLOOR DISC. BOX-SEB |
| | PCU |
| SEATS CENTER | PCU |
| | CA SEB-PCU |
| | FLOOR DISCONNECT BOX |
| | TERMINATOR-FDB |
| | SEAT ELECTRONIC BOX |
| | TERMINATOR-SEB |
| | CA SEB-SEB |
| | PCU |
| | FLOOR DISCONNECT BOX |
| | CA FLOOR DISC. BOX-SEB |
| | PCU |
| SEATS RH | PCU |
| | CA SEB-PCU |
| | SEAT ELECTRONIC BOX |
| | TERMINATOR-SEB |
| | CA SEB-SEB |
| | FLOOR DISCONNECT BOX |
| | CA FLOOR DISC. BOX-SEB |
| | PCU |

| 50MK1 | |
|---|---|
| 201MK1 | 2 |
| 121MK1 | 2 |
| 100MK1 | 2 |
| 180MK1 | 2 |
| | |
| | 80MK1 |
| 62MK1 | 154MK1 |
| 200MK1 | 2 |
| 201MK3 | 4 |
| 111MK1 | 2 |
| | 80MK2 |
| 181MK1 | 2 |
| 100MK25 | 26 |
| 180MK3 | 4 |
| | |
| | |
| | 80MK3 |
| 63MK1 | 154MK2 |
| | |
| 201MK5 | 6 |
| 123MK1 | 2 |
| 100MK49 | 50 |
| 180MK5 | 6 |
| | |
| | 80MK4 |
| 62MK2 | 154MK3 |
| 200MK3 | 4 |

| 50MK2 | | | | |
|---|---|---|---|---|
| 200MK5 | 7 | 8 | | 8 |
| 127MK1 | 3 | 4 | | 5 |
| 100MK3 | 5 | 6 | | 7 |
| 180MK7 | | | | 8 |
| 62MK3 | 4 | | | |
| | | | | 80MK5 |
| | | | 154MK4 | 151MK1 |
| 201MK7 | 9 | 10 | | 11 |
| 200MK10 | 11 | 12 | 13 | 300 |
| 127MK6 | 7 | 8 | 9 | 300 |
| | | | | 80MK6 |
| | | | 181MK3 | 4 |
| 100MK27 | 28 | 29 | 30 | 300 |
| 180MK9 | | | | 181MK5 |
| 62MK5 | 6 | 7 | 8 | |
| | | | | |
| | | | | 80MK7 |
| | | | | 154MK5 |
| 200MK12 | 13 | 14 | 15 | 300 |
| 200MK14 | 15 | 16 | 17 | 18 |
| 125MK1 | 2 | 3 | 4 | 5 |
| 100MK51 | 52 | 53 | 54 | 55 |
| 180MK10 | | | | 11 |
| 62MK9 | 10 | 11 | | |
| | | | | 80MK8 |
| | | | 62MK12 | 151MK2 |
| 201MK16 | 17 | 18 | 19 | 20 |



Passenger Entertainment (Music)
Seat Layout - Configuration (Sheet 2/4)
Figure 002

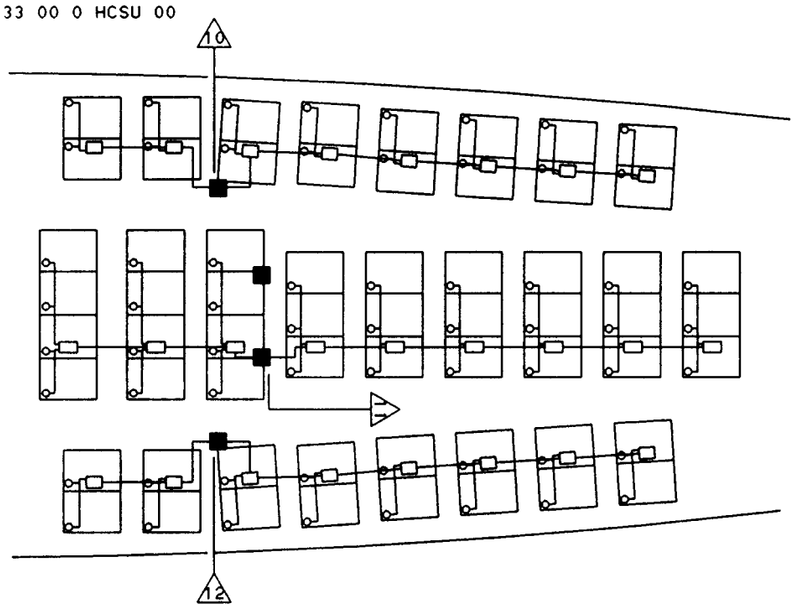
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PIA

| | 50MK3 | | | 80MK9 | | 154MK7 | | |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 50MK4 | | | | | | | |
| | | 80MK13 | | | | | |
| | | 154MK8 | 154MK9 | | | | |
| 151MK10 | | | 151MK11 | 12 | 13 | 14 | 15 |
| 100MK17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | | | | | | | |
| 135MK9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 203MK9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 203MK25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| | | | | | | | |
| 180MK14 | | | | | | | 180MK15 |
| 210MK9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 210MK25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 80MK14 | | | | | |
| 181MK7 | | 181MK8 | 181MK9 | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 151MK24 | 25 | | 151MK26 | 27 | 28 | 29 | 30 | |
| | | | | | | | | |
| 100MK40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 137MK10 | 11 | 12 | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 133MK10 | 11 | 12 | 141MK1 | 143MK1 | 2 | 3 | 4 | 5 |
| 202MK9 | 10 | 11 | 200MK20 | 202MK12 | 13 | 14 | 15 | 16 |
| 202MK25 | 26 | 27 | 200MK22 | 202MK28 | 29 | 30 | 31 | 32 |
| 202MK41 | 42 | 43 | 200MK24 | 202MK44 | 45 | 46 | 47 | 48 |
| 202MK57 | 58 | 59 | | | | | | |
| 210MK41 | 42 | 43 | | 210MK44 | 45 | 46 | 47 | 48 |
| 210MK57 | 58 | 59 | | 210MK60 | 61 | 62 | 63 | 64 |
| 210MK73 | 74 | 75 | | 210MK76 | 77 | 78 | 79 | 80 |
| 210MK89 | 90 | 91 | | | | | | |
| | | 154MK11 | 151MK31 | | | | | |
| | | | 80MK15 | | | | | |
| | | | | | | | | |
| 180MK17 | | | | | | | | 180MK18 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 80MK16 | | | | | |
| | | 154MK14 | 154MK15 | | | | |
| 151MK39 | | | 151MK40 | 41 | 42 | 43 | 44 |
| 100MK65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 |
| 133MK21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| | | | | | | | |
| 202MK68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 |
| 202MK84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 |
| | | | | | | | |
| 180MK21 | | | | | | | 180MK22 |
| 210MK100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 |
| 210MK116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 |

| | |
|---|---|
| SEATS RH | FLOOR DISTRIBUTION BOX |
| | FD |
| | CA FD-SEB |
| | CA SEB-SEB |
| | SEB |
| | CA SEB-PCU |
| | CA SEB-PCU |
| | PCU |
| | PCU |
| | TERMINATOR FOR FD |
| | TERMINATOR FOR SEB |
| | TRANSDUCER |
| | TRANSDUCER |
| SEATS CENTER | |
| | FD |
| | TERMINATOR FOR FD |
| | TERMINATOR FOR SEB |
| | CA FD-SEB |
| | CA SEB-SEB |
| | CA SEB-SEB |
| | SEB |
| | SEB |
| | CA SEB-PCU |
| | CA SEB-PCU |
| | ADAPTER CABLE |
| | CA SEB-PCU |
| | PCU |
| | PCU |
| | PCU |
| | PCU |
| | TRANSDUCER |
| | TRANSDUCER |
| | TRANSDUCER |
| | TRANSDUCER |
| | CA FD-SEB |
| | FD |
| | TERMINATOR FOR FD |
| | TERMINATOR FOR SEB |
| SEATS LH | |
| | FD |
| | CA FD-SEB |
| | CA SEB-SEB |
| | SEB |
| | CA SEB-PCU |
| | CA SEB-PCU |
| | PCU |
| | PCU |
| | TERMINATOR FOR FD |
| | TERMINATOR FOR SEB |
| | TRANSDUCER |
| | TRANSDUCER |

Passenger Entertainment (Music)
Seat Layout - Configuration (Sheet 4/4)
Figure 002

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3. System Description

The passenger entertainment system is divided into two parts as follows:

A. Passenger Entertainment System
The passenger entertainment system is supplied with 115 V AC and 28 V DC when the system circuit breakers are closed. When the passenger entertainment system is energized the audio reproducer distributes the audio signals to the main multiplexer. The main multiplexer distributes these multiplexed audio signals to the zone control unit. The zone control unit distributes these audio signals via the floor disconnect box and seat electronic box to the passenger control unit. These audio signals are audible over a headset on the passenger control unit. audible via PCU headset.

B. Passenger Service System
The Passenger Service System is designed to provide remote control for reading and steward call lights via the passenger control units. The passenger service system provide also test functions for all reading and steward call lights which are controlled by the BITE panel. The control of attendant calls and passenger compartment seat configurations is also provided by the master attendant passenger service panel.

4. Component Description

A. Audio Reproducer
The audio reproducer is designed to play back 12 channels of audio entertainment pre-recorded on six cassette tapes and consists of the following main assemblies:
- six tape decks
- a motor control and head amplifier card
- an interface card
- a main circuit card.

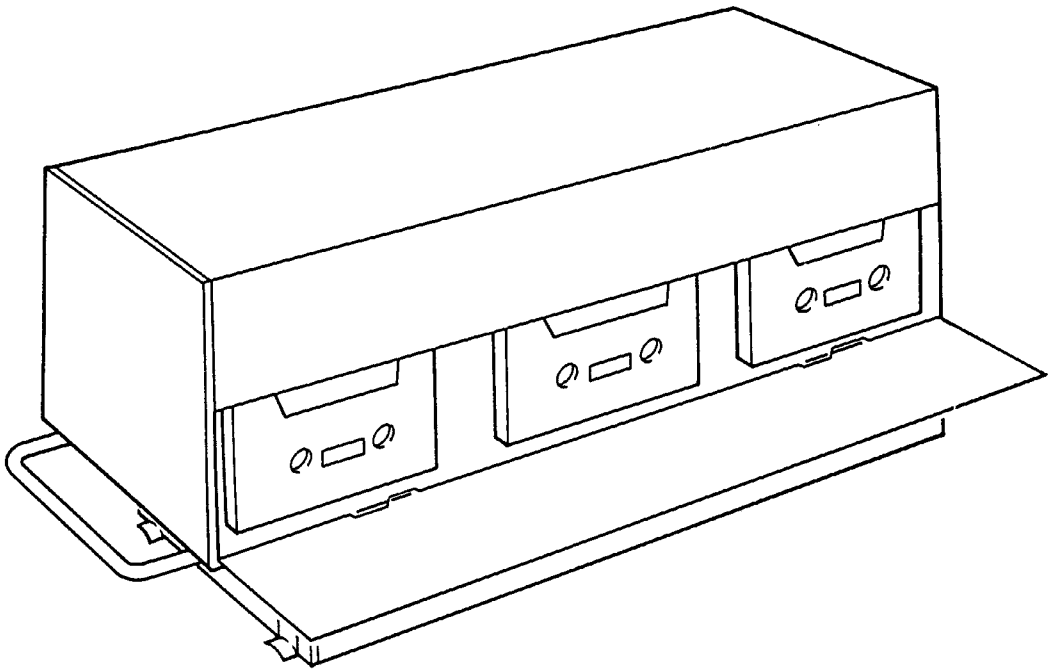
Each tape deck is fitted with a capstan and a reel motor to drive the cassette tapes. The capstan motor moves the tape in one direction only for playback while the reel motor drives the take-up reel during playback and rewinds the tape. A 4-channel magnetic head on each tape deck is used to play back the audio programs in conjunction with two solenoids which position and hold the head and pinch roller in contact with the tape.
A motor control and head amplifier card fitted to each tape deck feeds the reproduced audio signal via an interface card assembly to the main circuit card assembly. This card contains four head pre-amplifiers, drive and control circuits for the motors, solenoid control electronics and receive/send logic signal electronics. The interface assembly provides the audio paths and logic signal interface between the main circuit card assembly and the tape decks. The main circuit card provides overall logic control, by an 8-bit microprocessor and final amplification of the audio signals. A special track arrangement is used to record the six cassettes. They are recorded in pairs, identified 1A/1B, 2A/2B and 3A/3B, so that the first half of the program on each

track is on cassette A and the second half on cassette B.
This card is also equipped with a dual in-line package (DIP) switch, accessible when the bottom cover of the reproducer is removed. The DIP switch contains four single-throw switch elements. In the ON position, switch element 1 enables extended play for tape decks 3A and 3B. Switch elements 2, 3 and 4 disable tape decks 1A/1B, 2A/2B and 3A/3B respectively when in the OFF position. The reproducer is also capable of feeding the audio output from cassette pair 3A/3B, to the PA system amplifier for transmitting as boarding music over the PA loudspeakers.
On each side of the reproducer is a hinged door which opens downwards to give access to the tape decks for loading the cassettes into the tape reproducer.
(Ref. Fig. 004)

B. Main Multiplexer
The main multiplexer accepts 36 input channels of audio or video programs from an audio or video reproducer. It sequentially converts each of the 36 analog inputs into a multiplexed signal and transmits the 24 channels of stereo or monaural programs under control of an external key line to each of the zone control units.
The main multiplexer provides a method to program all entertainmet audio inputs as stereo, monaural or in case of audio video channels Bi-lingual or stereo. The automatic program sets all channels to monaural if a BITE signal is received. When the BITE signal is removed, all channels are returned to the programmed state. The audio channels are designated as 1 thru 24 and the audio video channels are designated as video 1A/1B, video 2A/2B, video 3A/3B, and video 4A/4B.
The PA override mode occurs on an individual zone basis, and is activated for a zone by the associated zone multiplexer section when the PA keyline for that zone is grounded.
(Ref. Fig. 005)

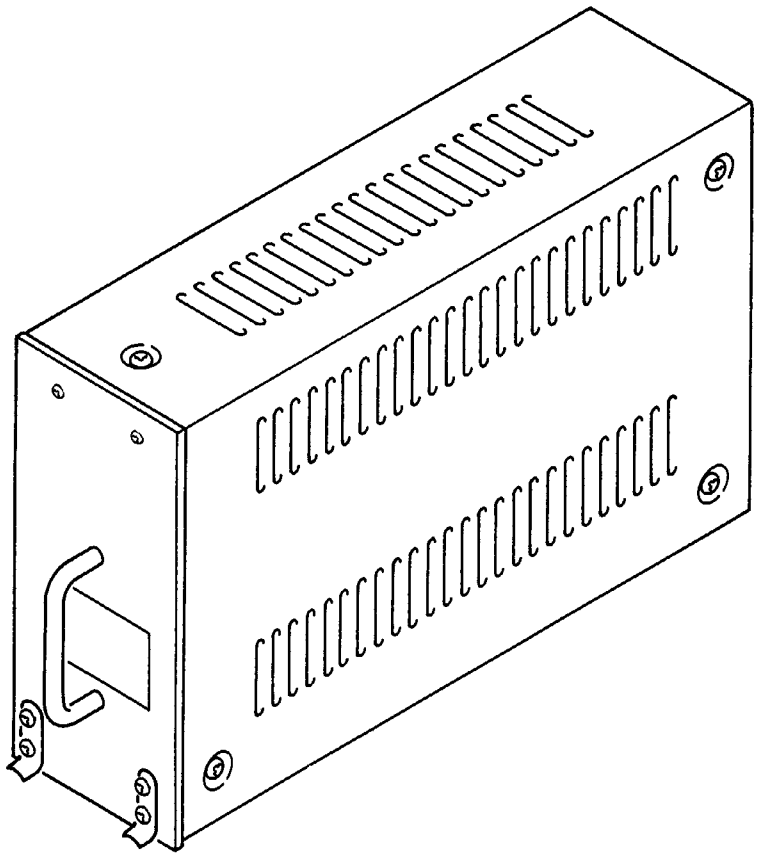
C. Master Attendant Passenger Service Panel (MAPSP)
The MAPSP is a component of PES/PSS and a service for communication between attendant and passengers. The MAPSP is equipped with a READING LIGHT ON P/B, READING LIGHT OFF P/B, MASTER RESET P/B, DISPLAY, NEXT CALL P/B, INITIAL SET P/B, MODE SELECT P/B, DATA ENTER P/B '10 KEY' keybord, 'RV' key, and 'CL' key. These functions are used to make seat configurations and to set a video service range, to turn on or off all reading lights, to display seat numbers for attendant call, and to make the cancellation in the aircraft.
(Ref. Fig. 006)

D. BITE Panel
The BITE is a component of PES/PSS and is used to control all BITE functions of the systems. The BITE panel contains four TEST OK LIGHTS which illuminate when the test is ok.
The following test procedures are performed by the BITE panel:
(1)NORMAL
The NORMAL position is not a test procedure. Set the selector switch in NORMAL position if the PES/PSS in used.



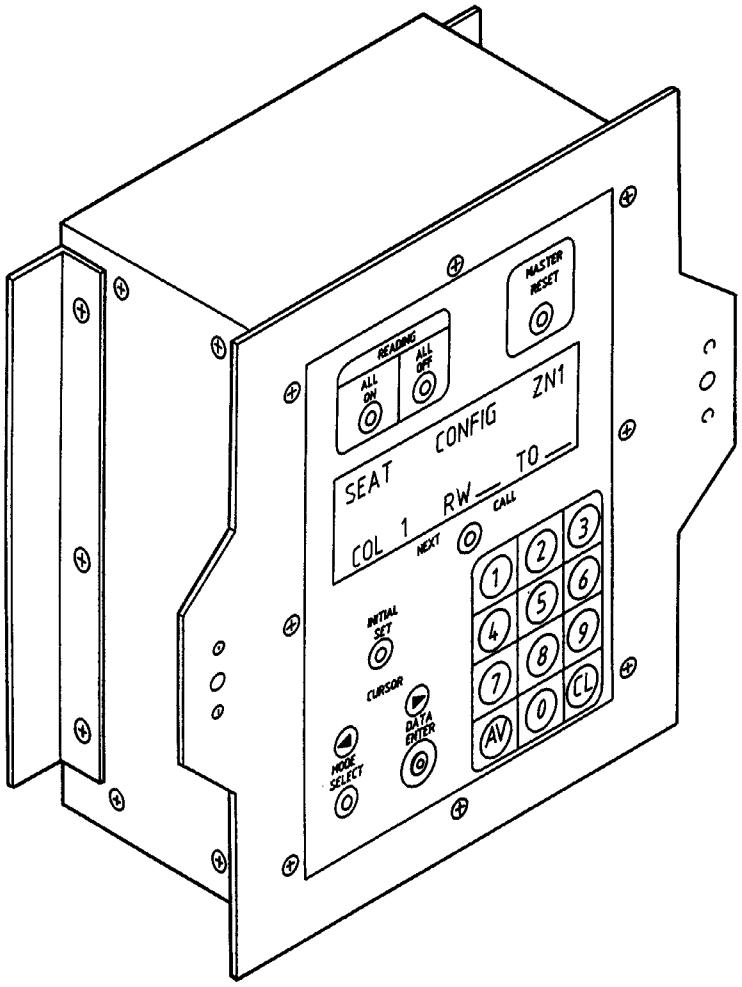
BM6 23 33 00 0 HGAO-00

Audio Reproducer
Figure 004



BM6 23 33 00 0 HKAO-00

Main Multiplexer
Figure 005




BM6 23 33 00 0 HMAO-00

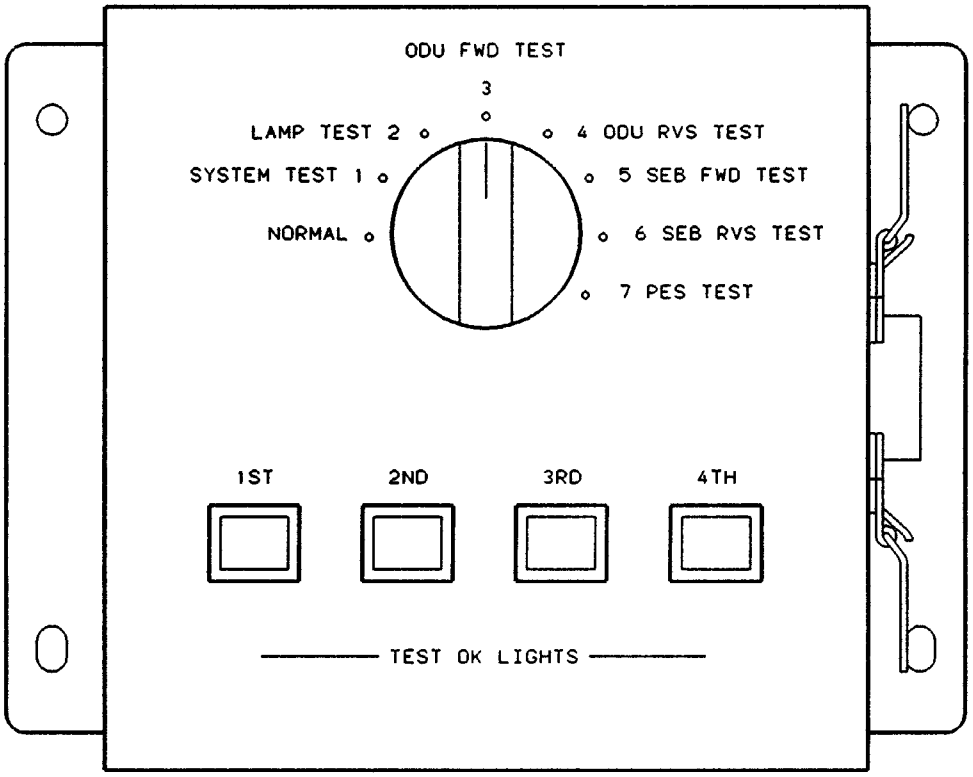
Master Attendant Passenger Service Panel
Figure 006

(2)SYSTEM TEST
This procedure checks the audio function (PES) and service function (PSS) but not reading lights or call lights.
(3)LAMP TEST
This procedure checks the reading lights, call lamps, master call lights, chime and BITE panel test ok lights.
(4)Overhead Decoder Unit (ODU) FWD Test
This procedure checks the ODU forward data lines and ODU electronics, including the reading light drivers.
(5)ODU RVS Test
This procedure checks the ODU reverse data lines and ODU electronics, including the reading light drivers.
(6)Seat Electronic Box (SEB) FWD Test
This procedure checks the SEB forward data lines and the PSS part of seat electronic box.
(7)Seat Electronic Box (SEB) RVS Test
This procedure checks the SEB reverse data lines and the PSS part of seat electronic box.
(8)PES Test
This procedure checks all data lines of PES including main multiplexer, zone control unit, seat electronic box and passenger control unit (PCU). The transducers of PCU are checked for malfunctioning and in addition a HI speed data function in SEB.
(Ref. Fig. 007)

E. Zone Control Unit
The zone control unit (ZCU) is an interface between SEB, MAPSP and main multiplexer.
The following functions are performed by the ZCU:
The ZCU receives an audio signal from the main multiplexer and transfers the multiplexed signal to each SEB. The ZCU receives data signals and commands from PCU via SEB and transfers the signals to the respective ODU and MAPSP. The ZCU accepts the programmed aircraft seat configurations.
(Ref. Fig. 008)

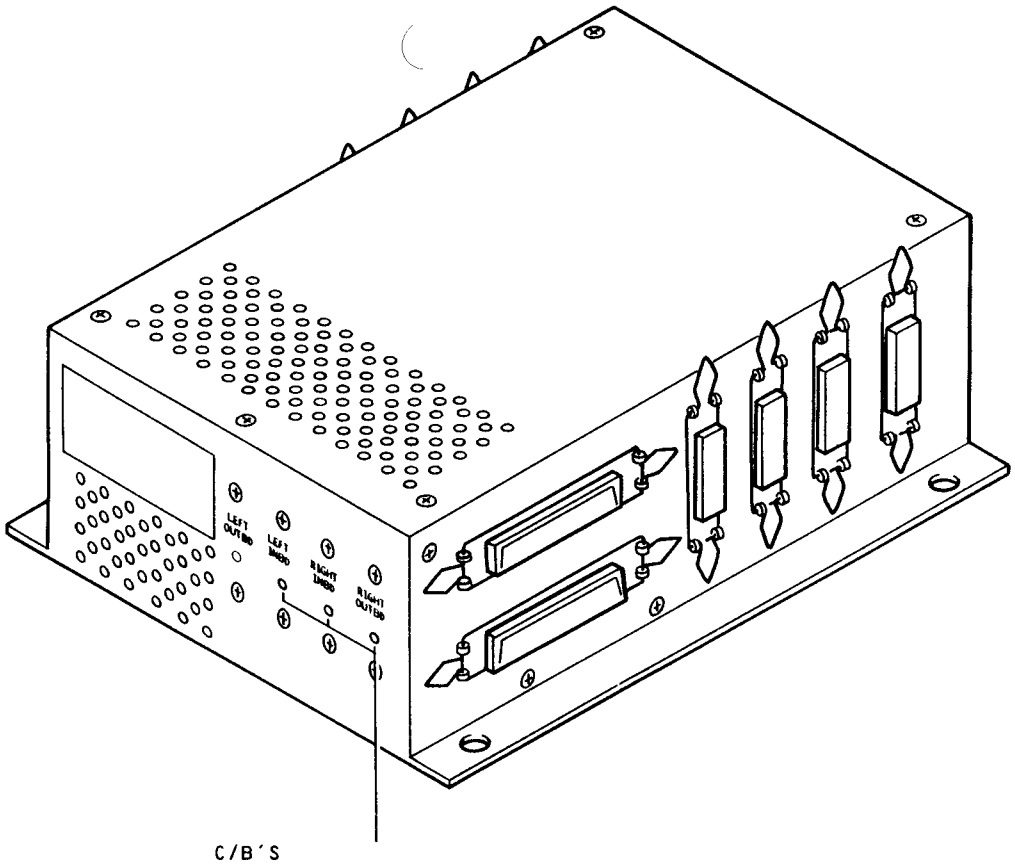
F. Floor Disconnect Box
The floor disconnect box (FDB) is an interface between ZCU and SEB.
The following functions are performed by FDB:
The FDB receives a PES/PSS signal and power supply from ZCU. The PES/PSS signals which are amplified by driver circuit and power supply are transfers via each SEB to each PCU. The FDB receives PES/PSS signals from PCU for distribution to ZCU.
(Ref. Fig. 009)

G. Seat Electronic Box
The basic function of the SEB is to receive encoded and multiplexed data from the main multiplexer, to decode this data and provide an audio output. Fourteen (14) of the digital and time-divided multiplexed data signals from the main multiplexer are accepted, together with channel selected signals from up to four passenger control units (PCU), in the form of DC voltage, dependent on the switch selection of one of twelve resistor



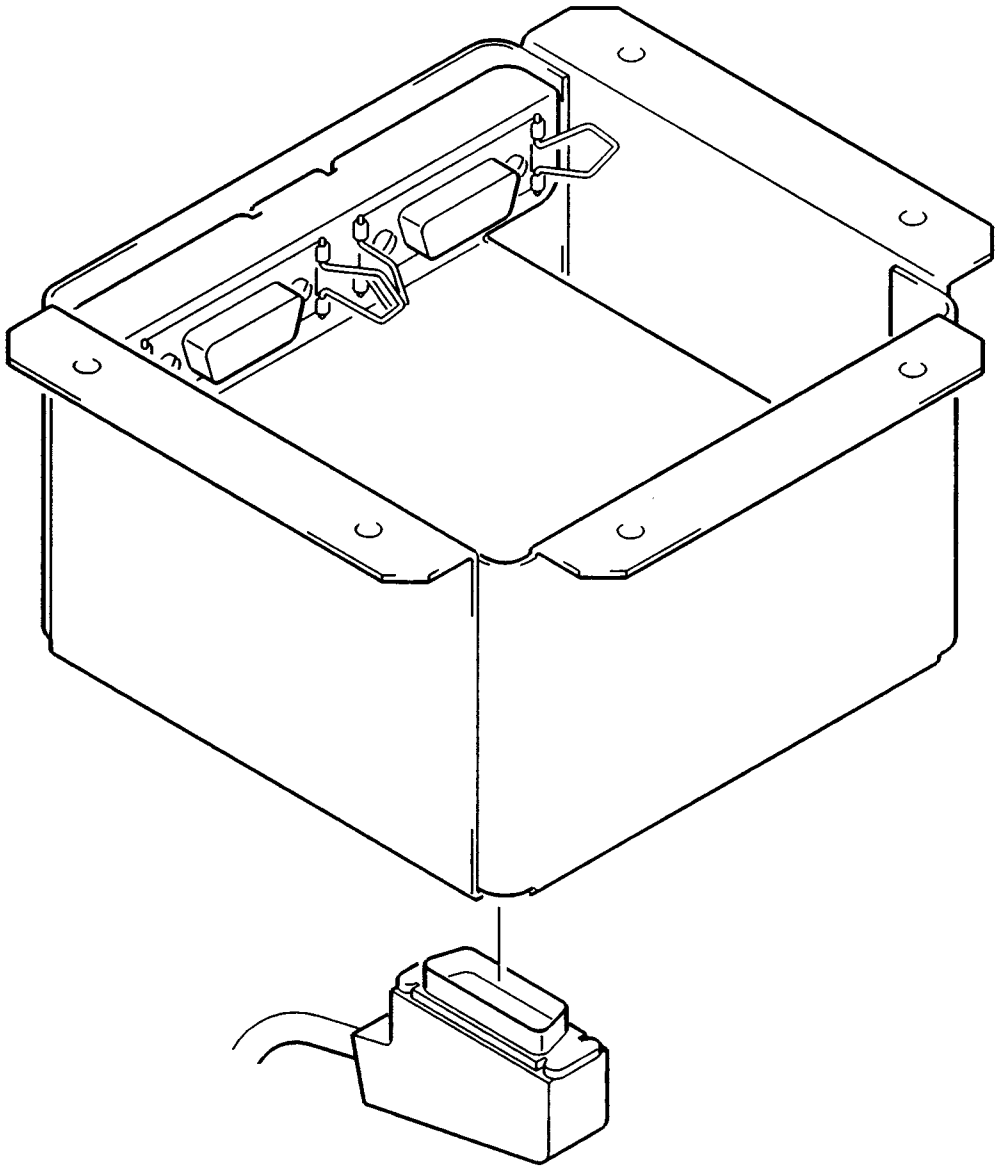

B M 6 23 33 00 0 HPA0 00

BITE Panel
Figure 007




BM6 23 33 00 0 HRA0-01

Zone Control Unit
Figure 008



BM6 23 33 00 0 HXA0 00

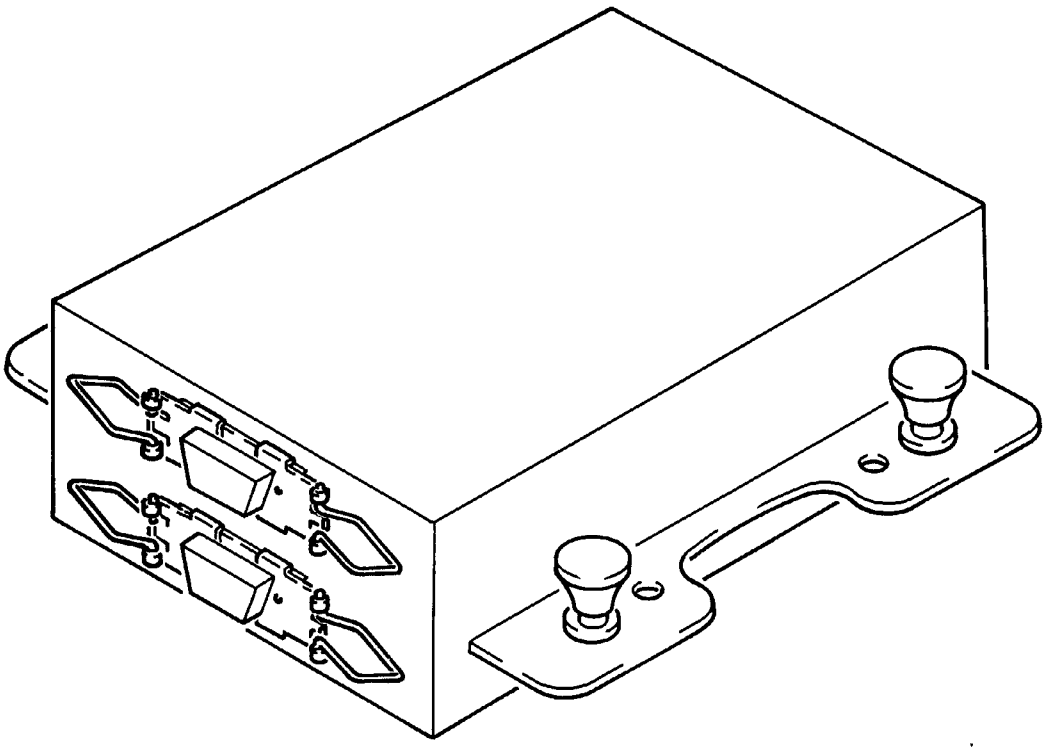
Floor Disconnect Box
Figure 009

values, which are common to ground on one end.
The output signal consists of a left and right audio output per seat, which may be either stereo or monaural.
The SEB consist tow separate parts (PES/PSS).
(Ref. Fig. 010)

H. Passenger Control Unit (PCU)
The passenger compartment contains two kinds of PCU's.
The PCU has the following functions:
- CHANNEL P/B which enables the selection of any one of the 12 audio entertainment channels. The selected channel is displayed on an LED display next to the other P/B's,
- VOLUME P/B enables the audio entertainment output level to be set,
- a headset jack enables the connection of an headset,
- ATTENDANT call P/B which enables the passenger to call the attendant and to cancel the call,
- a LIGHT P/B which enables the passenger to switch on or off the reading lights.

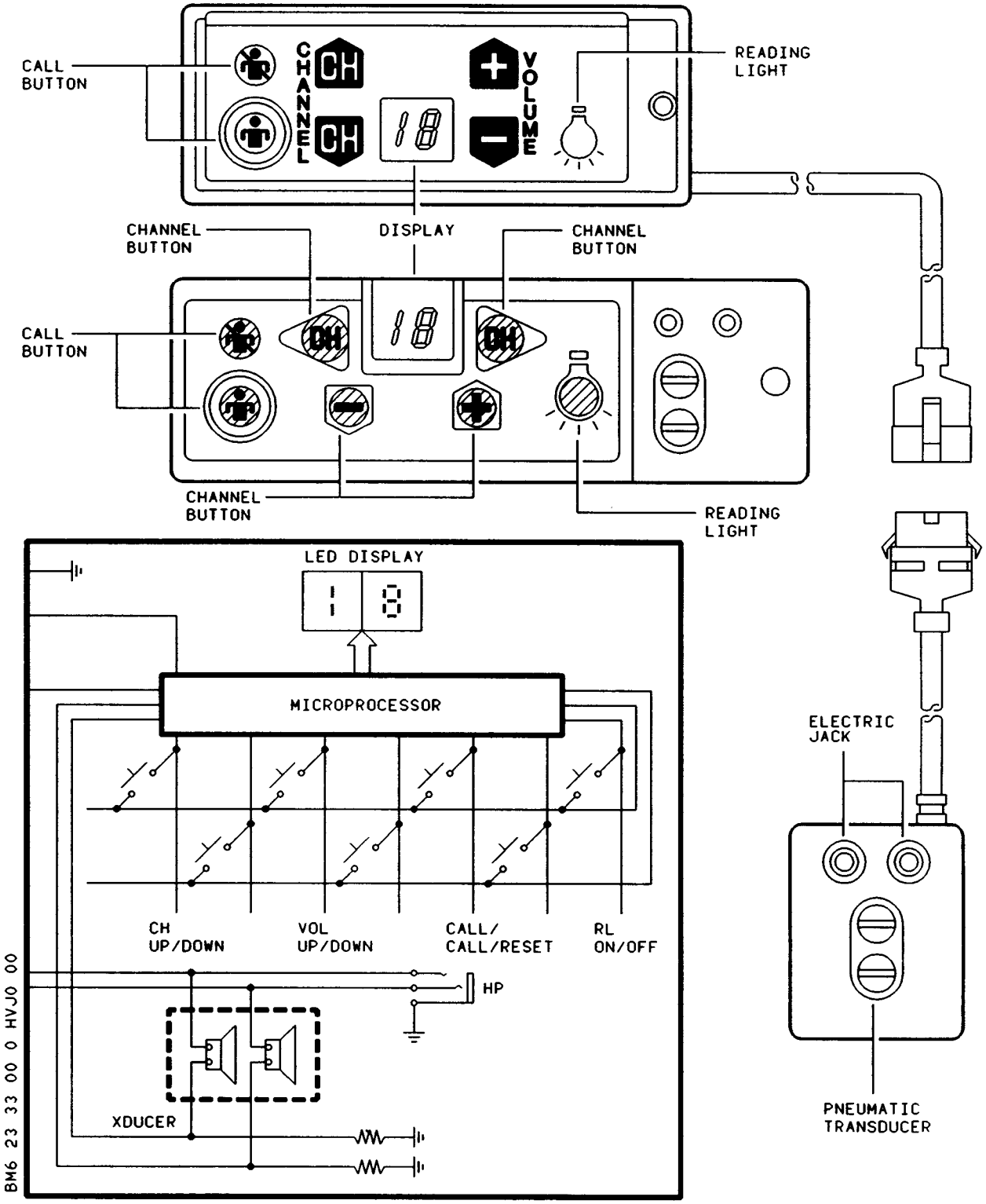
(Ref. Fig. 011)

5. Power Supply
The passenger entertainment (music) system is supplied thru the system circuit breakers with 115 V AC from busbar 110XP-C and 28 V DC from busbar 102PP.
(Ref. Fig. 012)

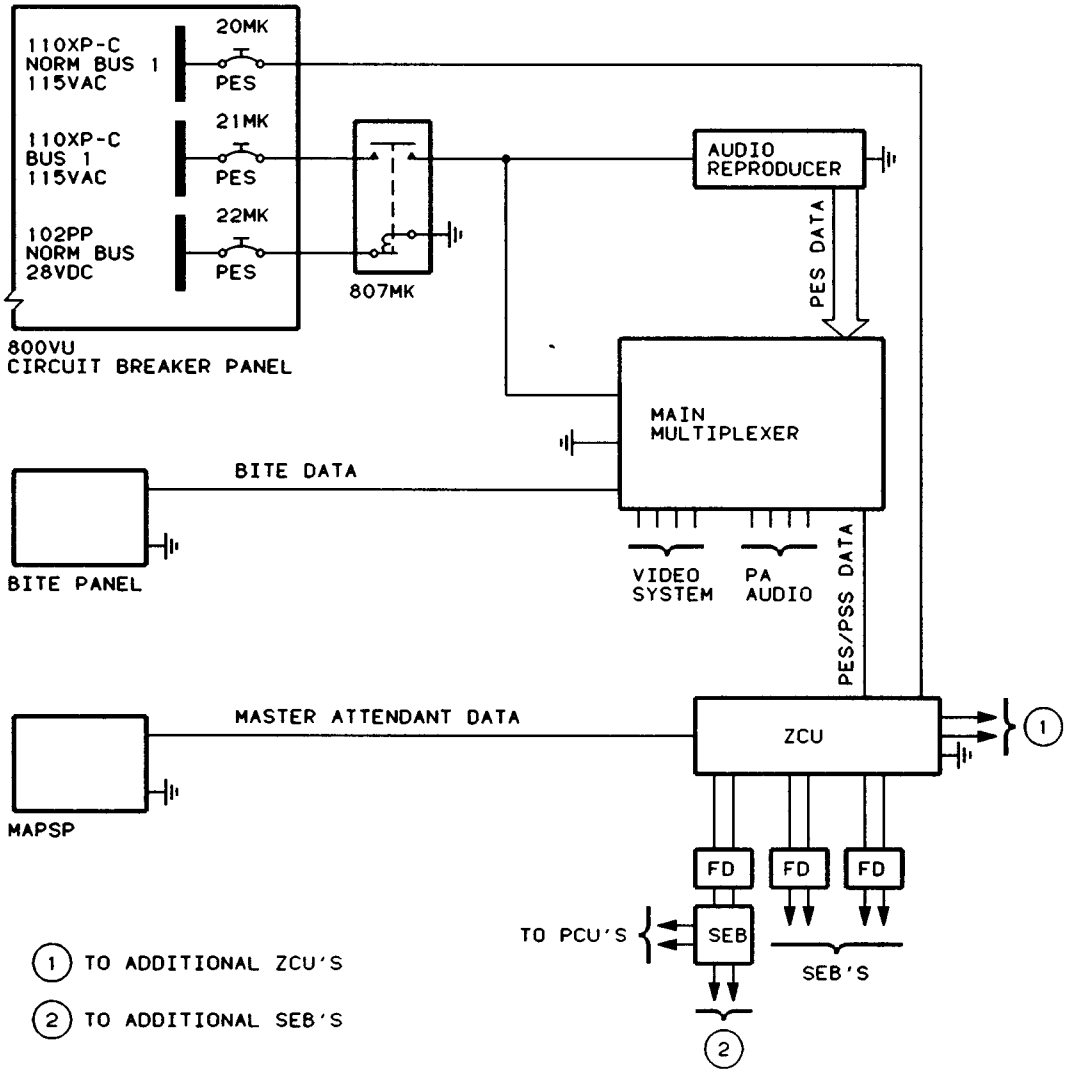


BM6 23 33 00 0 HTAO-00

Seat Electronic Box
Figure 010




Passenger Control Unit
Figure 011




B M 6 23 33 00 0 HEB0 01

Power Supply - Block Diagram
Figure 012

6. System Operation

A. Cassette Loading
Access to the tape decks is gained by unlatching and opening the hinged doors on each side of the reproducer. Cassettes are loaded in accordance with the cassette number shown on the inside of each door and the background colors of the cassette labels.
The background colors are a guide to the correct pairing of the cassettes and are as follows:

| Color | Cassette No. | |
|---|---|---|
| Solid red | 1A | No. 1 Program pair |
| Red stripes | 1B | |
| Solid yellow | 2A | No. 2 Program pair |
| Yellow stripes | 2B | |
| Solid blue | 3A | No. 3 Program pair |
| Blue stripes | 3B | |

The cassettes are aligned with the tape deck shafts, their respective numbers facing outwards, and pushed into the cassette cartridge. A contour of the correct cassette orientation is shown on the tape deck. The access door must be closed and latched when the six cassettes are loaded. (Ref. Fig. 013)

B. Energization
When the system circuit breakers are closed, 115 V AC and 28 V DC is supplies to the relay 807MK. Relay 807MK is energized and supplies 115 V AC to the audio reproducer, main multiplexer and the zone control unit. 28 V DC is supplies to the zone control unit. The audio reproducer starts to run when the system circuit breakers are closed.

C. Program Selection
Individual selection and volume control of the entertainment programs stored on the cassette is made at the passenger control unit (PCU).
The accompanying sound from the passenger entertainment video programs can also be selected at the PCU.
The channel arrangement on the PCU is as follows:

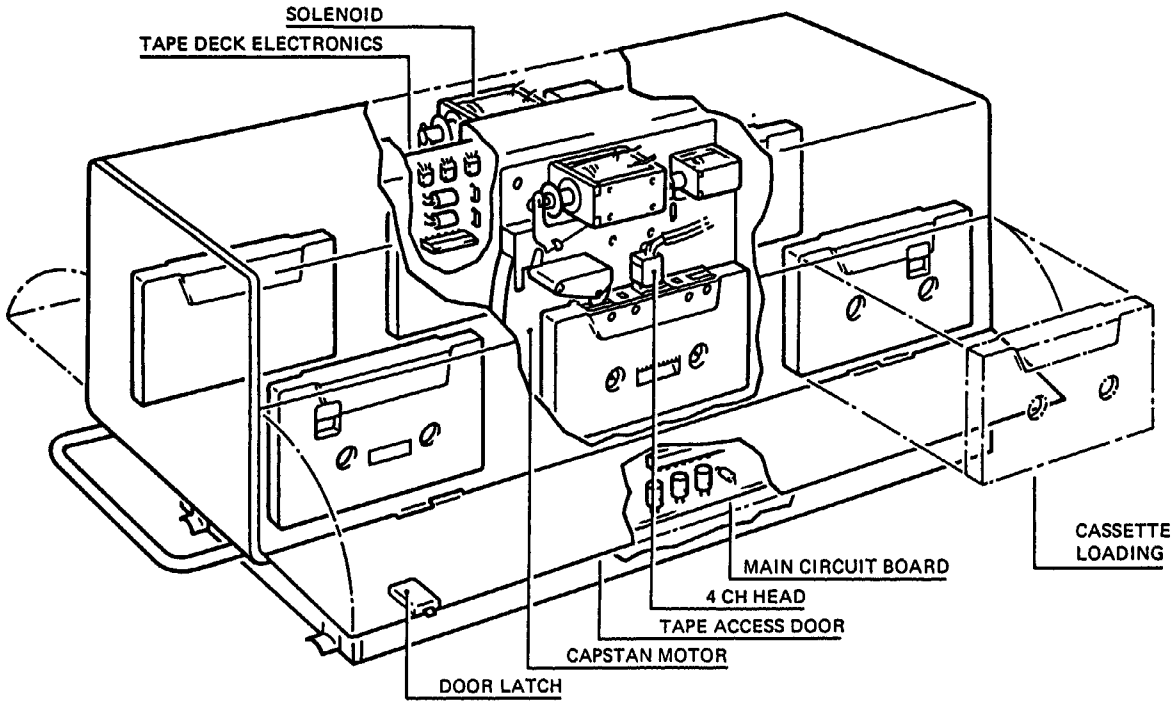
| PCU Channel | Tape Deck | A/R Channel | Contents |
|---|---|---|---|
| 1 | -- | - | Entertainment Video |
| 2 | -- | - | Entertainment Video |
| 3 | 3B | 10 | Entertainment Music (Mono) |
| 4 | 3B | 12 | Entertainment Music (Mono) |
| 5L | 1A | 1 | Entertainment Music (Stereo) |
| 5R | 1A | 3 | Entertainment Music (Stereo) |

| PCU Channel | Tape Deck | A/R Channel | Contents |
|---|---|---|---|
| 6L | 1B | 2 | Entertainment Music (Stereo) |
| 6R | 1B | 4 | Entertainment Music (Stereo) |
| 7 | 2A | 5 | Entertainment Music (Mono) |
| 8 | 2A | 7 | Entertainment Music (Mono) |
| 9 | 2B | 6 | Entertainment Music (Mono) |
| 10 | 2B | 8 | Entertainment Music (Mono) |
| 11 | 3A | 9 | Entertainment Music (Mono) |
| 12 | 3A | 11 | Entertainment Music (Mono) |

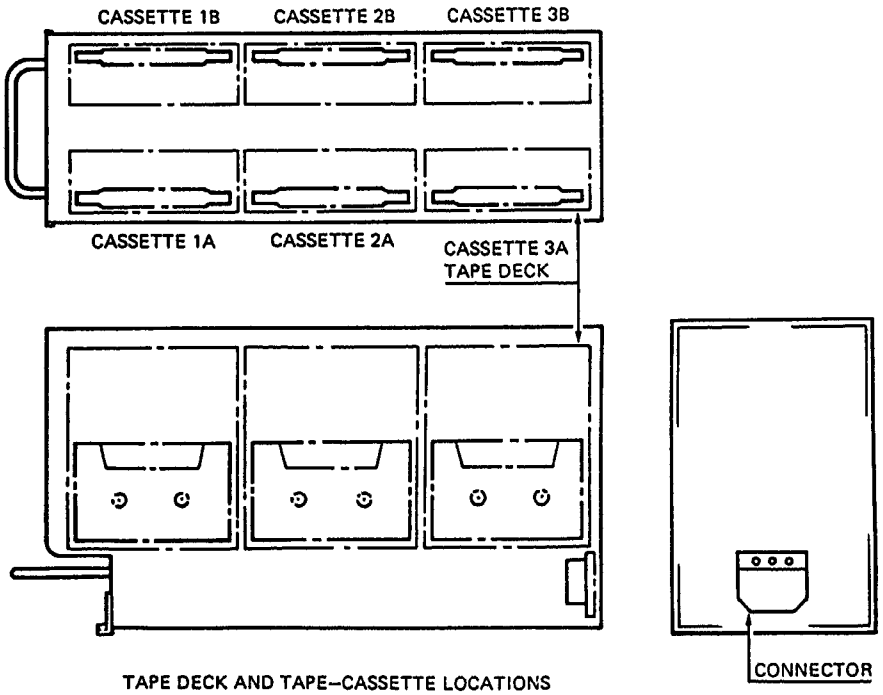
The selected channel program can be heard over the headset connected to the passenger control unit.

D. Priority Announcement
During an announcement from the flight crew or the announcement/music tape reproducer system, the main multiplexer keylines are grounded. The announcement is fed via the passenger address amplifier to the main multiplexer announce-override circuits, causing the audio signal on all channels to be simultaneously overridden for the duration of the announcement in the respective zones.

E. Entertainment Video Selection
Two channels of audio video program are applied to each zone, when the passenger entertainment video system is activated.
When mono channel 1 or 2 is selected, the audio video program is audible over a headset connected to the passenger control unit (PCU). (Ref. Fig. 014)



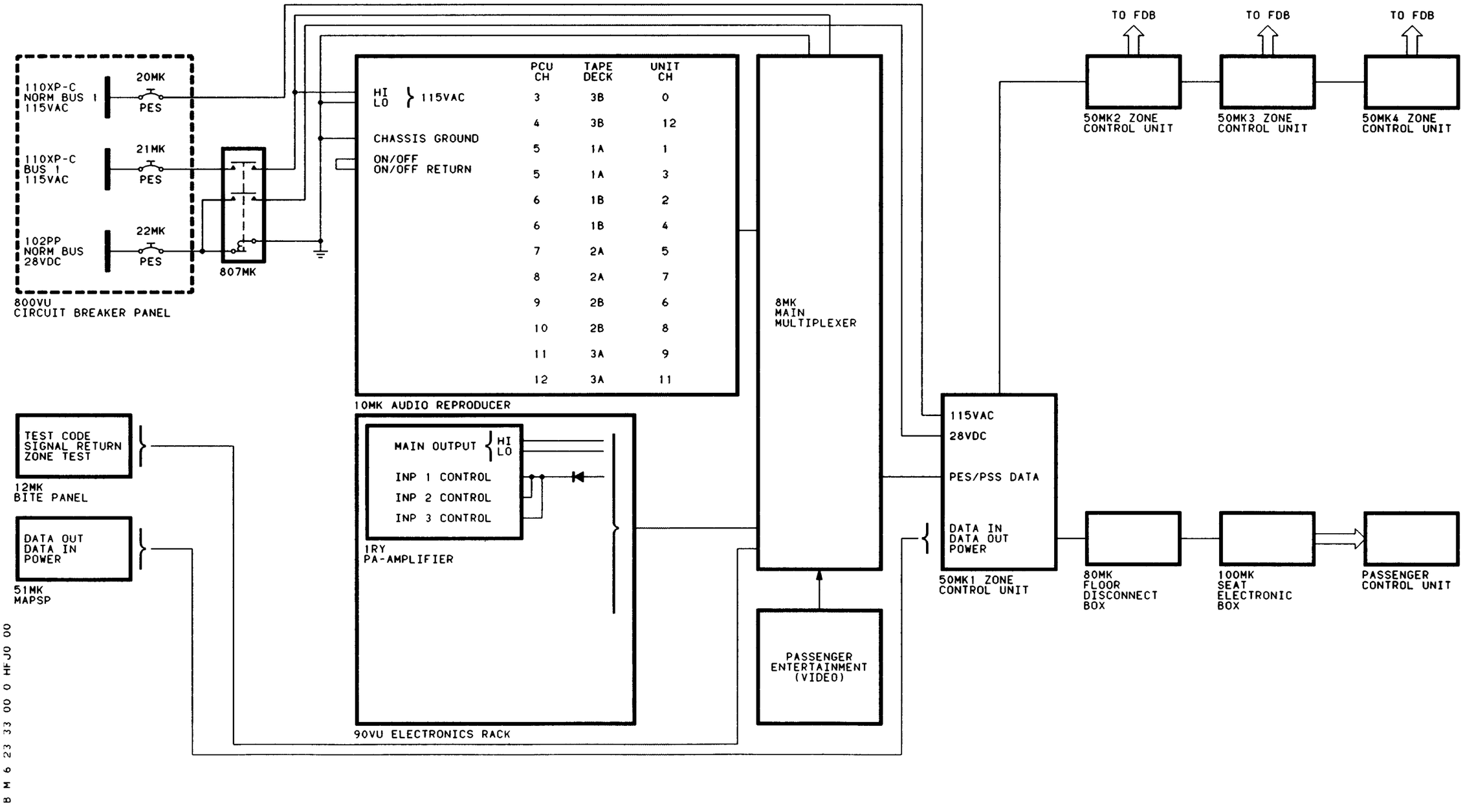

CUT–AWAY VIEW OF TAPE REPRODUCER




TAPE DECK AND TAPE–CASSETTE LOCATIONS

BM6 23 33 00 0 HHAO–00

Audio Reproducer - Loading/Unloading (Tape)
Figure 013




Passenger Entertainment (Music)
Schematic
Figure 014

1. Operational Test

A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| (2) | Pneumatic Headset |
| (3) | Electrical Headset |
| (4) | Tape Cassettes for Tape Reproducer |

Referenced Procedures

| | |
|---|---|
| - 23-31-00, P. Block 501 | Passenger Address System |
| - 24-41-00, P. Block 301 | AC External Power Control |

B. Procedure

(1)Job Set-Up

(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that electronics racks ventilation is correct.

(c)Make certain that the following system is operating:

- Passenger Address (Ref. 23-31-00, P. Block 501)

(b)Make certain that electronics racks ventilation is correct.

(c)Make certain that the following systems are operating:

- Flight Interphone (Ref. 23-41-00, P. Block 501)
- Passenger Address (Ref. 23-31-00, P. Block 501)
- Cockpit Voice Recorder (Ref. 23-71-00, P. Block 501)

(d)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | PES | 21MK | D 2 |
| 800VU | PES | 22MK | D 3 |
| 22VU | RCDR CTL | 5RK | F 27 |

(2)Test

(a)Selftest

NOTE : Make certain that test tape is inserted in Tape Reproducer (T/R) 10MK.

| ACTION | RESULT |
|---|---|
| 1. On panel 746VU:<br>- press pushbutton switch PES TEST to ON position. | On panel 746VU:<br>- integral light in pushbutton switch PES TEST comes on.<br>At each Passenger Control Unit (PCU):<br>- all PCU channel displays indicate a dash code '-'. |

| ACTION | RESULT |
|---|---|
| - press pushbutton switch PES TEST to OFF position. | - indications at all PCU channel displays go off. |
| NOTE : Before further test procedures are performed check that all PCU channel displays indicate a dash code '-'. | |
| (b)Test of entertainment music | |

| ACTION | RESULT |
|---|---|
| 1. On panel 746VU:<br>- press pushbutton switch T/R TEST to ON position. | On panel 746VU:<br>- integral light in pushbutton switch T/R TEST comes ON.<br>In passenger compartment:<br>- announcements of track identifications are heard on appropriate PCU channels 1 thru 8, 11 and 12. |
| 2. At each Passenger Control Unit (PCU):<br>- connect headset, select channels 1 thru 8, 11 and 12.<br>- rotate volume control thumbwheel at each section through complete range. | At each PCU:<br>- verify over headset that the different track identifications are heard with full volume control. |
| 3. At purser's station (878VU):<br>- lift handset, press PA pushbutton and make an announcement.<br>- replace handset. | In passenger compartment:<br>- at any PCU, spoken announcement is heard over channels 1 thru 8, 11 and 12.<br>- track identifications come on again. |
| 4. At purser's station (746VU):<br>- press pushbutton switch T/R TEST to OFF position. | On panel 746VU:<br>- integral light in pushbutton switch T/R TEST goes off.<br>In passenger compartment:<br>- at PCU's track identifications go off. |
| 5. On panel 746VU:<br>- press PES ON/OFF pushbutton to ON position. | On panel 746VU:<br>- integral light in pushbutton switch PES ON/OFF comes on. |
| 6. On panel 22VU:<br>- open circuit breaker 5RK.<br>- close circuit breaker 5RK. | At PCU's:<br>- track identifications are heard over channels 1 thru 8, 11 and 12.<br>- track identifications go off. |
| 7. On panel 746VU:<br>- press PES ON/OFF pushbutton to OFF position. | On panel 746VU:<br>- integral light in pushbutton switch PES ON/OFF goes off. |
| 8. On T/R (10MK) remove test tape. | |
| (3)Close-Up | |

(a)De-energize aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(b)Deactivate all systems activated in para B. (1)(c).
(c)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

1. Operational Test

A. Reason for the Job

(1)BITE Test of PES/PSS.

(2)Test of Seat Music.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| (2) | Audio Reproducer Test Tape Cassettes<br>Matsushita PN: RD-AM 9501A1<br>Matsushita PN: RD-AM 9502A1<br>Matsushita PN: RD-AM 9503A1 |
| (3) | Electrical/Pneumatic Headset |

Referenced Procedures

| | |
|---|---|
| - 23-31-00, P. Block 501 | Passenger Address System |
| - 23-38-00, P. Block 501 | Passenger Service System |
| - 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

(1)Job Set-Up

(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that electronic racks ventilation is working.

(c)Make certain that the following systems are working:

- Passenger Address System (Ref. 23-31-00, P. Block 501)
- Passenger Service System (Ref. 23-38-00, P. Block 501)

(d)Make certain that the following circuit breakers are closed:

| | PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|---|
| R | 800VU | PES/PSS | 20MK | D 1 |
| R | 800VU | PES/PSS | 21MK | D 2 |
| R | 800VU | PES/PSS | 22MK | D 3 |

(2)Test

(a)BITE test of Passenger Entertainment / Passenger Service System

NOTE: Make certain that selector switch on BITE panel 12MK which is behind a cover on purser's station, is in position 'NORMAL'.

R NOTE: To aviod wrong test result it is necessary to set the selector
R switch step by step and wait for respective test result (each
R test needs approx 30 sec.), before the selector switch is set
R to the next test step.

| | ACTION | RESULT |
|---|---|---|
| R | 1. On BITE panel:<br>- set selector switch in<br>R POS 1 'System TEST'. | On Bite panel:<br>- 'TEST OK LIGHTS' come on.<br><br>In passenger compartment:<br>- a HI chime is heard over the loudspeakers. |
| R | - set selector switch in<br>R POS 2 'LAMP TEST'. | - all 'TEST OK LIGHTS' come on. |
| R | - set selector switch in<br>R POS 5 'SEB FWD TEST'. | On BITE panel:<br>- 'TEST OK LIGHTS' come on.<br><br>In passenger compartment:<br>- The call lights come on from first to last seat row sequentially. |
| R | - set selector switch in<br>R POS 6 'SEB RVS TEST'. | On Bite panel:<br>- 'TEST OK LIGHTS' come on.<br><br>In passenger compartment:<br>- The call lights come on and go off from last to first seat row sequentially. |
| R | - set selector switch in<br>R POS 7 'PES TEST'. | On BITE panel:<br>- 'TEST OK LIGHTS' come on.<br><br>In passenger compartment:<br>- The call lights come on and remain on.<br>At passenger control unit:<br>- a horizontal bar appears on PCU display. |
| R | - set selector switch in POS 'NORMAL'. | On BITE panel:<br>- 'TEST OK LIGHTS' go off.<br><br>In passenger compartment:<br>- The call lights go off. |

(b)Test of Seat Music

NOTE: Make certain that audio reproducer 10MK is loaded with test tape cassettes.

| ACTION | RESULT |
|---|---|
| 1. At each passenger control unit:<br>- connect headset, select channels 3 thru 12 and at each selection rotate volume control thumbwheel thru complete range. | At each passenger control unit:<br>- verify over headset that the different music programs played on channels 3 thru 12 vary smoothly in volume. |

| ACTION | RESULT |
|---|---|
| 2. At purser's station:<br>- remove handset, press P/B 'P/A', press P/B 'PTT' and make an announcement. | At passenger control units:<br>- over headset, music program goes off.<br>- spoken announcement is heard over channels 3 thru 12. |
| - release P/B 'PTT' and replace handset. | - over headset, announcement from purser's station goes off.<br>- music programs are heard over channels 3 thru 12. |

(3)Close-Up

R (a)De-energize Passenger Address System (Ref. 23-31-00, P. Block 501).
R (b)De-energize Passenger Service System (Ref. 23-38-00, P. Block 501)
R (c)De-energize aircraft electrical network and disconnect electrical
R ground power unit (Ref. 24-41-00, P. Block 301).
R (d)Make certain that working area is clean and clear of tools and
R miscellaneous items of equipment.

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |
| Referenced Procedure<br>- 23-33-00, P. Block 501 | Passenger Entertainment System |

2. Procedure
(Ref. Fig. 401)

A. Job Set-Up
(1)Open, safety and tag the following circuit breaker :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | PES | 21MK | D 2 |

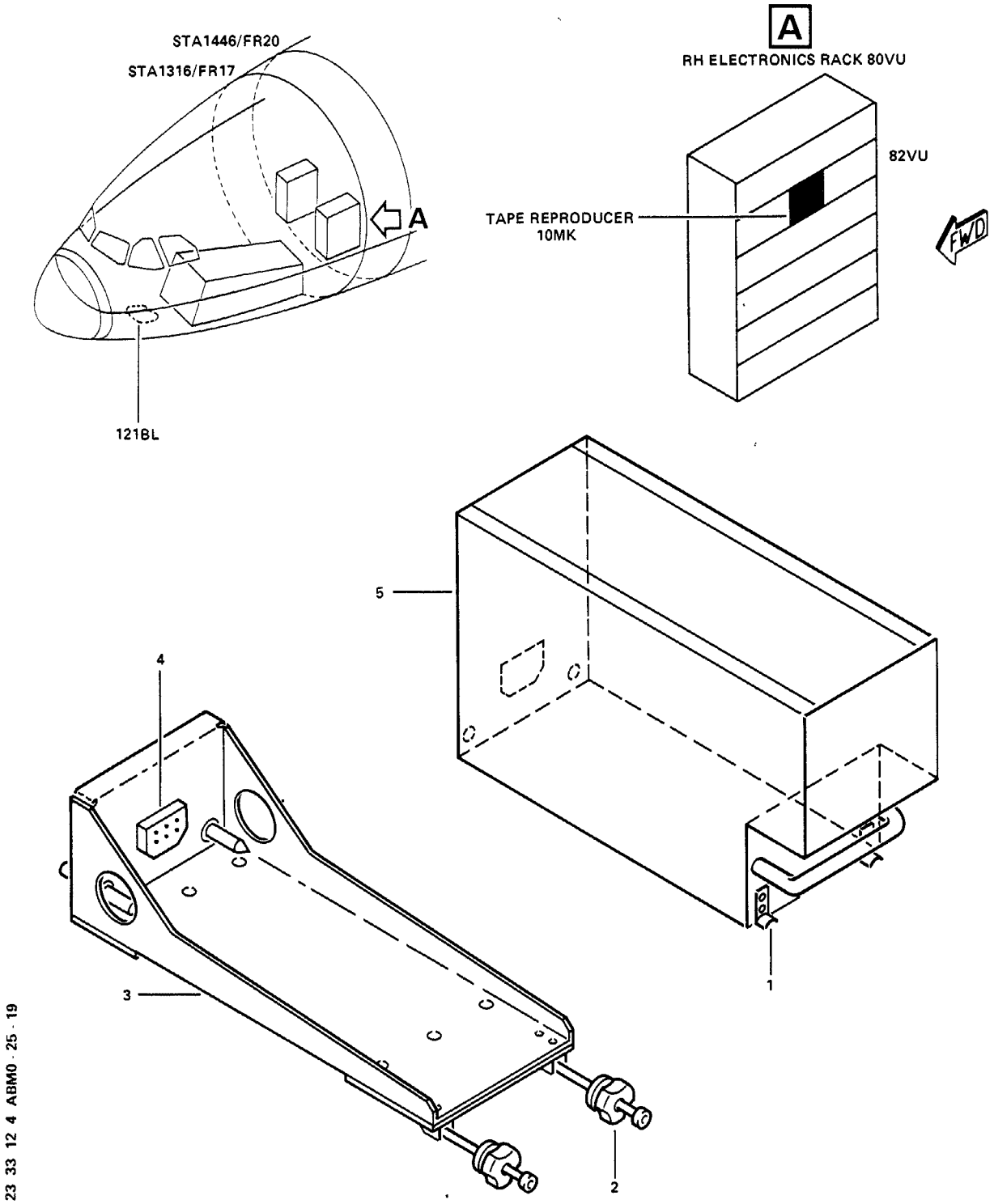
(2)Open access door 121BL.

B. Removal
(1)Unscrew knurled nut (2) and free lug (1) on reproducer (5).
(2)Withdraw reproducer (5) from mount (3).
(3)Remove reproducer (5).
(4)Cap electrical connector (4).

C. Installation
(1)Clean and inspect reproducer (5) interface.
(2)Remove blanking caps from electrical connector (4).
Check for correct condition of connectors.
(3)Position reproducer (5) on mount (3) and fully push.
(4)Position knurled nuts (2) and tighten onto lug (1) of reproducer.
(5)Remove safety clip and tag and close circuit breaker 21MK.

D. Test
Carry out an operational test of passenger entertainment music
(Ref. 23-33-00, P. Block 501).

E. Close-Up
(1)Make certain that working area is clean and clear of tools and
miscellaneous items of equipment.
(2)Close access door 121BL.




Audio-Reproducer
Figure 401

R

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |
| Referenced Procedure<br>- 23-33-00, P. Block 501 | Passenger Entertainment System |

2. Procedure
(Ref. Fig. 401)

A. Job Set-Up
(1)Open, safety and tag the following circuit breaker :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | PES | 21MK | D 2 |

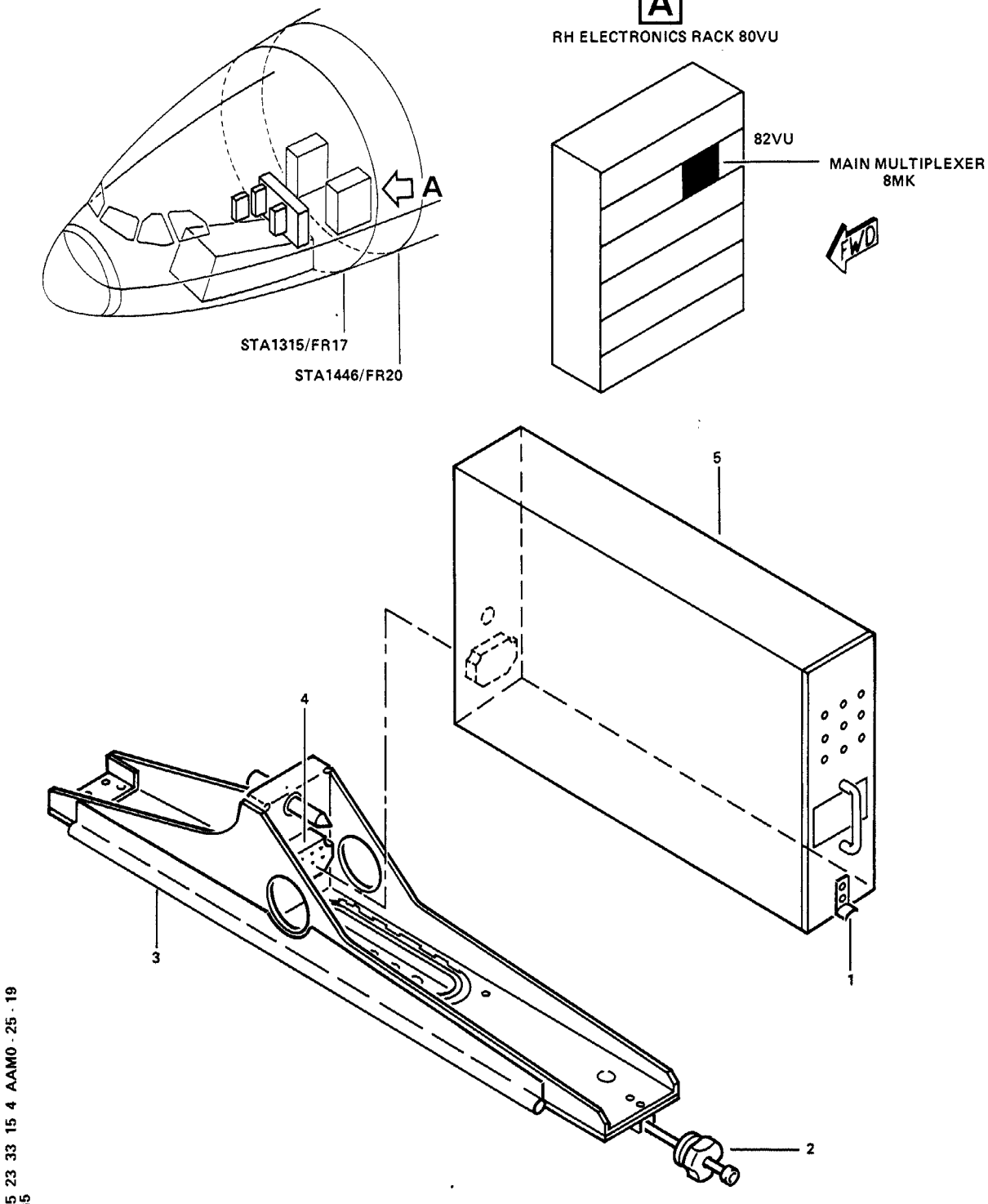
(2)Open access door 121BL.

B. Removal
(1)Unscrew knurled nuts (2) and free lug (1) on multiplexer (5).
(2)Withdraw multiplexer (5) from mount (3).
(3)Remove multiplexer (5).
(4)Cap electrical connector (4).

C. Installation
(1)Clean and inspect multiplexer (5) interface.
(2)Remove blanking cap from electrical connector (4).
Check for correct condition of connector.
(3)Position multiplexer (5) on mount (3) and fully push.
(4)Position knurled nut (2) and tighten onto lug (1) of multiplexer.
(5)Remove safety clip and tag and close circuit breaker 21MK.

D. Test
Carry out an operational test of passenger entertainment system
(Ref. 23-33-00, P. Block 501).

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close access door 121BL.




Main Multiplexer
Figure 401

BITE PANEL - REMOVAL/INSTALLATION

WARNING: ISOLATE THE ELECTRICAL CIRCUITS FROM THE RELATED EQUIPMENT AND THE ENVIRONMENT.

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| B. | Blanking Cap |

Referenced Procedures

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 23-38-00, P. Block 501 | Passenger Service System |
| - 33-25-00, P. Block 501 | Passenger Reading Lights |

2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | PES/PSS | 20MK | D 1 |
| 800VU | PES/PSS | 21MK | D 2 |
| 800VU | PES/PSS | 22MK | D 3 |

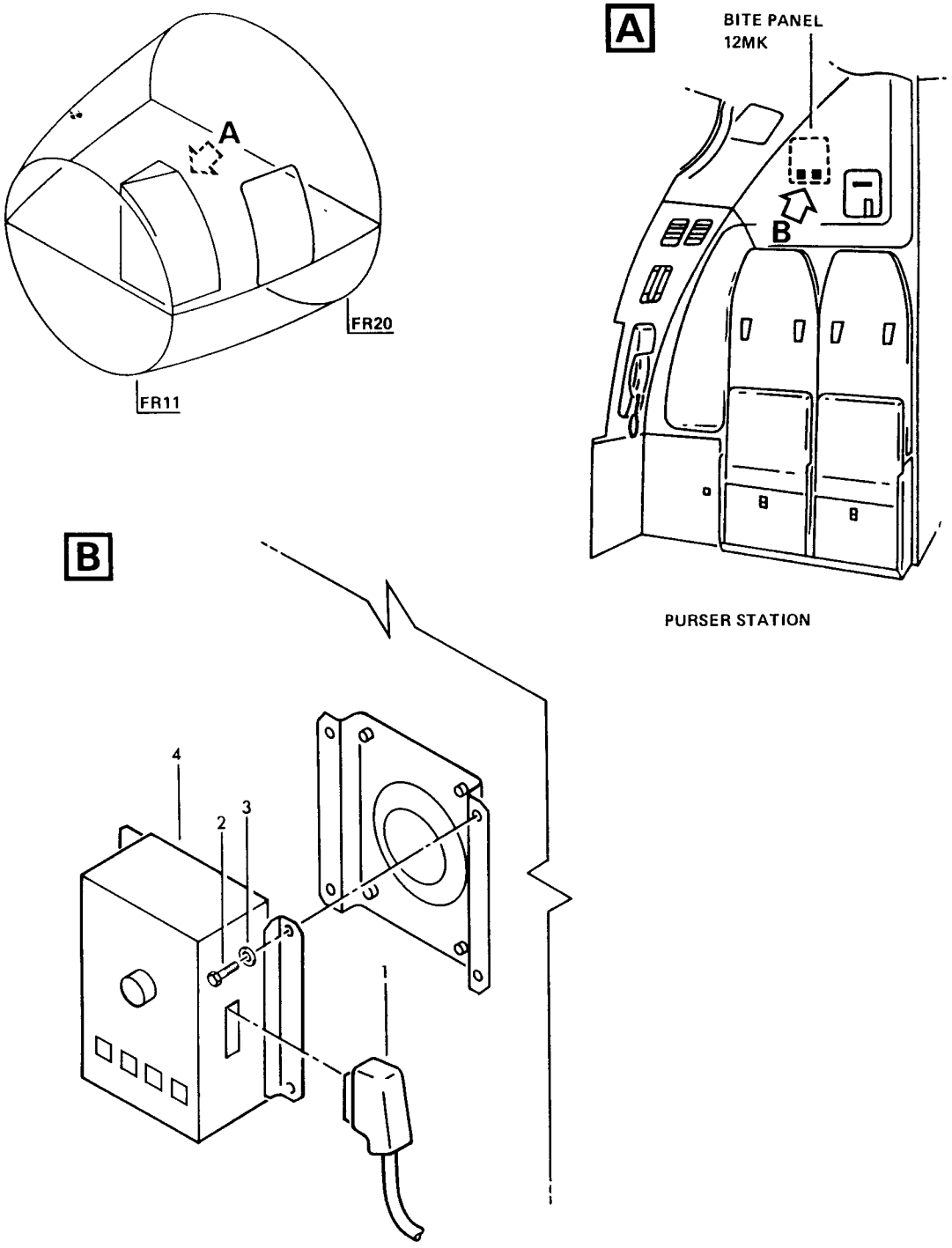
B. Removal (Ref. Fig. 401)
(1)Open the cover on purser's station.
(2)Disconnect the electrical connector (1).
(3)Put blanking cap on the disconnected electrical connector.
(4)Remove the screws (2), washers (3) and BITE Panel (4).

C. Installation (Ref. Fig. 401)
(1)Install the BITE Panel (4) with screws (2) and washers (3).
(2)Remove the blanking cap from the electrical connector (1).
NOTE : Make sure that the electrical connector is clean and in good condition.
(3)Connect the electrical connector (1).
(4)Close the cover on purser's station.

D. Test
(1)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Make certain that electronics racks ventilation is working.
(3)Energize Passenger Services System (Ref. 23-38-00, P. Block 501).
(4)Energize Passenger Reading Light System (Ref. 33-25-00, P. Block 501).
(5)Remove safety clips and tags and close the circuit breakers opened in step 2. A. (1).
NOTE : Make certain that selector switch on the BITE Panel, which is behind a cover at the purser's station, is in the NORMAL position and all TEST OK LIGHTS are off.
NOTE : During the following test procedure, after switching between switch positions, all the TEST OK LIGHTS initially go off.

| ACTION | RESULT |
|---|---|
| 1. On BITE Panel (12MK): | On BITE Panel (12MK): |
| - set selector switch to the SYSTEM TEST 1 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the LAMP TEST 2 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the NORMAL position. | - all TEST OK LIGHTS go off. |
| - set selector switch to the ODU FWD TEST 3 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the ODU RVS TEST 4 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the SEB FWD TEST 5 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the SEB RVS TEST 6 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the PES TEST 7 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the NORMAL position. | - all TEST OK LIGHTS go off. |

E. Close-Up




BM6 23 33 17 4 AAA0 00

BITE Panel
Figure 401

(1)De-energize Passenger Services System (Ref. 23-38-00 P. Block 501).
(2)De-energize Passenger Reading Light System (Ref. 33-25-00 P. Block 501).
(3)De-energize electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).
(4)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

WARNING: ISOLATE THE ELECTRICAL CIRCUITS FROM THE RELATED EQUIPMENT AND THE ENVIRONMENT.

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| B. | Access Platform, 2.7 m (9 ft.) |
| C. | Blanking Caps |

Referenced Procedures

| | |
|---|---|
| - 23-31-00, P. Block 501 | Passenger Address System |
| - 23-38-00, P. Block 501 | Passenger Service System |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 25-54-10, P. Block 201 | FWD Cargo Compartment Linings |
| - 25-55-10, P. Block 201 | AFT Cargo Compartment Linings |
| - 33-25-00, P. Block 501 | Passenger Reading Lights |

2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers:

| | PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|---|
| | 800VU | PES/PSS | 20MK | D1 |
| | 800VU | PES/PSS | 21MK | D2 |
| | 800VU | PES/PSS | 22MK | D3 |
| R | 800VU | READING LIGHT PASSENGER | 1LW | C1 |
| R | 800VU | READING LIGHT PASSENGER | 2LW | C2 |
| R | 800VU | READING LIGHT PASSENGER | 3LW | C3 |
| R | 800VU | READING LIGHT PASSENGER | 4LW | C4 |
| R | 800VU | READING LIGHT PASSENGER | 5LW | C5 |
| R | 800VU | READING LIGHT PASSENGER | 6LW | C6 |
| R | 800VU | READING LIGHT PASSENGER | 7LW | C7 |
| R | 800VU | READING LIGHT PASSENGER | 8LW | C8 |
| R | 800VU | READING LIGHT PASSENGER | 9LW | C9 |
| R | 800VU | READING LIGHT PASSENGER | 10LW | C10 |
| R | 800VU | READING LIGHT PASSENGER | 11LW | C11 |
| R | 800VU | READING LIGHT PASSENGER | 12LW | C12 |

(2)In the cargo compartment, remove the necessary ceiling panels to gain access to the zone control unit (ZCU) (Ref. 25-54-10, P. Block 201 and 25-55-10, P. Block 201).

B. Removal (Ref. Fig. 401)

CAUTION : MAKE MATCH MARKS ON ALL THE ELECTRICAL WIRES BEFORE YOU DISCONNECT THE ELECTRICAL CONNECTORS.

(1)Remove the spring latches (1) and disconnect the electrical connectors (2).
(2)Remove the screws (3) and washers (4).
(3)Remove the Zone Control Unit (5).
(4)Put blanking caps on the disconnected connectors.

C. Installation (Ref. Fig. 401)

(1)Install the Zone Control Unit (5) with screws (3) and washers (4).
(2)Remove blanking caps from the connectors (2).

NOTE: Make sure that the electrical connector is clean and in good condition.

CAUTION : REFER TO THE MATCH MARKS MADE DURING THE REMOVAL WHEN YOU CONNECT THE ELECTRICAL CONNECTORS.

(3)Connect the electrical connectors (2) and secure the spring latches (1).

D. Test

(1)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Make certain that electronics rack ventilation is working.
(3)Remove safety clips and tags and close the circuit breakers opened in step 2. A. (1).
(4)Energize the passenger address system (Ref. 23-31-00, P. Block 501).
(5)Energize the passenger service system (Ref. 23-38-00, P. Block 501).
(6)Energize the passenger reading light system (Ref. 33-25-00, P. Block 501).

NOTE : The presentation on the master attendant passenger service panel (MAPSP) 51MK display could vary dependant on the MAPSP software.

NOTE : Make certain that selector switch on BITE Panel, which is behind a cover on purser's station, is in the NORMAL position and all the TEST OK LIGHTS are off.

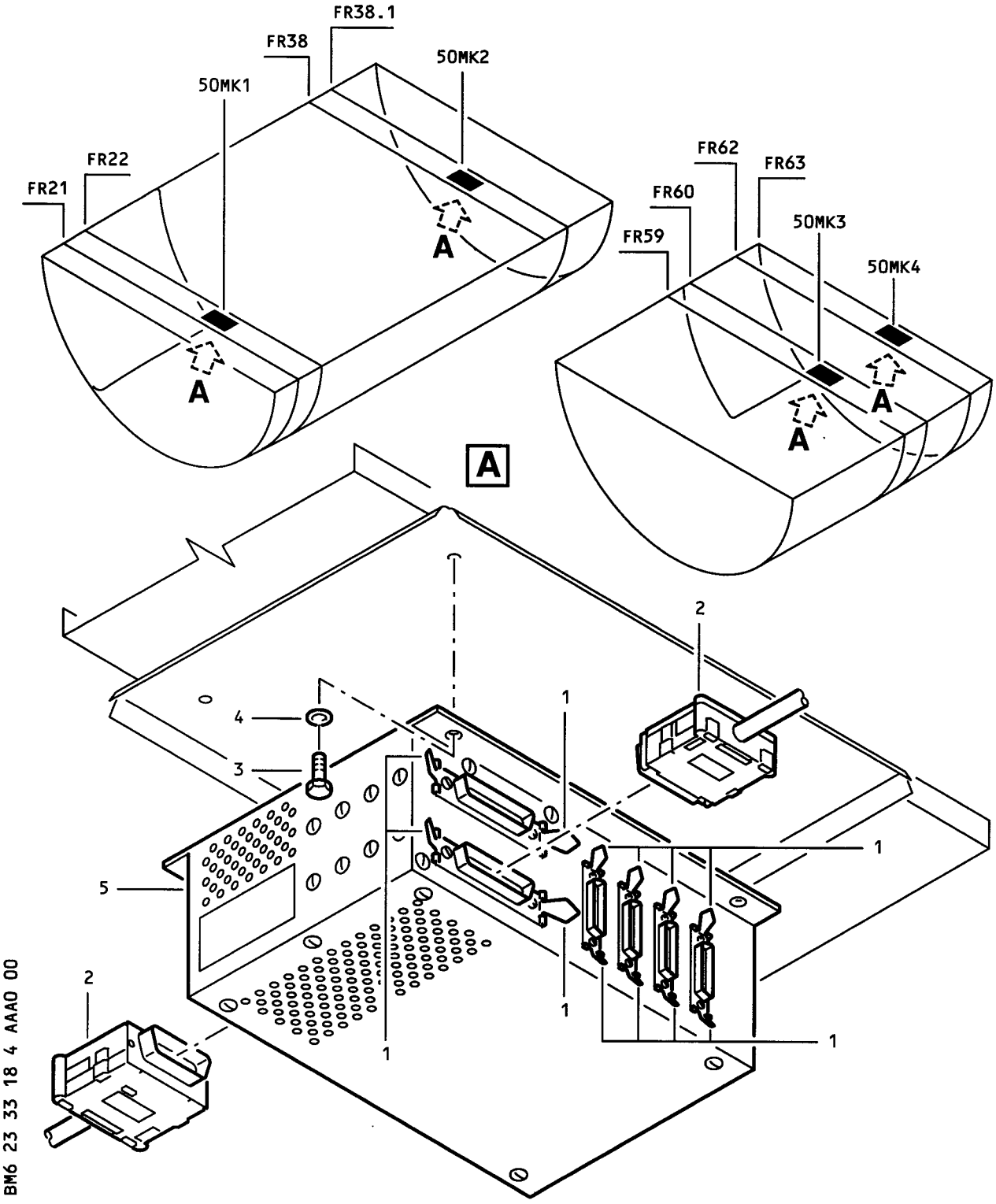
NOTE : After the installation of the zone control unit (ZCU), the passenger entertainment systems and the passenger services system must be reset by the following Recall Default Configuration.

| ACTION | RESULT |
|---|---|
| 1. On MAPSP 51MK, at purser's station: | On MAPSP display: |
| - press, in sequence , pushbutton switches MODE SELECT, 8, 1, 2, 6 and MODE SELECT. | - SEAT CONFIG ZN1 is shown. |
| - press simultaneously pushbutton switches INITIAL SET and ENTER. | - ZCU1SYSCOL1RW 01 is shown. |
| - press simultaneously pushbutton switches INITIAL SET, RV and CL. | - LAYOUT CLR/SET is shown. |
| - press pushbutton switch MODE SELECT. | - ZCU1SYSCOL1RW 01 is shown. |
| - press, in sequence, pushbutton switches CL, CL and ENTER. | - INITIAL SET is shown. |
| - press simultaneously pushbutton | - SEAT CONFIG ZN1 is shown. |

| ACTION | RESULT |
|---|---|
| switches INITIAL SET an MODE SELECT. | |
| - press pushbutton switch MODE SELECT. | - VIDEO CONFIG ZN1 is shown. |
| - press pushbutton switch MODE SELECT. | - PASSENG CALL ZN1 is shown. |
| - press pushbutton switch MODE SELECT. | - CHIME CONFIG ZN1 is shown. |
| - press pushbutton switch MODE SELECT. | - MASTER CALL ZN1 is shown. |
| - press pushbutton switch MODE SELECT. | - SENDING CONFIG PLEASE WAIT is shown.<br>- the display goes off. |
| NOTE : During the following test procedure, after switching between switch positions, all the TEST OK LIGHTS go off. | |
| 2. On BITE Panel: | On BITE Panel: |
| - set selector switch to the SYSTEM TEST 1 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the LAMP TEST 2 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the NORMAL position. | - all TEST OK LIGHTS go off. |
| - set selector switch to the ODU FWD TEST 3 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the ODU RVS TEST 4 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the SEB FWD TEST 5 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the SEB RVS TEST 6 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the PES TEST 7 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the NORMAL position. | - all TEST OK LIGHTS go off. |

E. Close-Up

(1) In the cargo compartment, install the ceiling panels removed in step 2. A. (2) (Ref. 25-54-10, P. Block 201 and 25-55-10, P. Block 201).
(2) De-energize the passenger address system (Ref, 23-32-00, P. Block 501).
(3) De-energize the passenger service system (Ref. 23-38-00, p. Block 501).
(4) De-energize the passenger reading light system (Ref. 33-25-00, P. Block 501).
(5) De-energize electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).
(6) Remove access platform.
(7) Make certain that working area is clean and clear of tools and miscellaneous items of equipment.




Zone Control Unit
Figure 401

## MASTER ATTENDANT PASSENGER SERVICE PANEL - REMOVAL/INSTALLATION

**WARNING: ISOLATE THE ELECTRICAL CIRCUITS FROM THE RELATED EQUIPMENT AND THE ENVIRONMENT.**

### 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| B. | Blanking Cap |

Referenced Procedures

| | |
|---|---|
| - 23-31-00, P. Block 501 | Passenger Address System |
| - 23-38-00, P. Block 501 | Passenger Service System |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 33-25-00, P. Block 501 | Passenger Reading Lights |

### 2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following ciruit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | PES/PSS | 20MK | D 1 |
| 800VU | PES/PSS | 21MK | D 2 |
| 800VU | PES/PSS | 22MK | D 3 |

B. Removal
(1)Remove the screws (1) and remove the cover plate (2).
(2)Disconnect the electrical connector (3) from the Master Attendant Passenger Service Panel (MAPSP) (6).
(3)Remove the screws (4) and the washers (5).
(4)Remove the MAPSP (6).
(5)Install a blanking cap on the disconnected electrical connector.

C. Installation
(1)Put the MAPSP (6) in the installed position and secure with screws (4) and washers (5).
(2)Remove the blanking cap from the electrical connector (3).
NOTE : Make sure that the electrical connector is clean and in good condition.
(3)Connect the electrical connector (3).
(4)Install the cover plate (2) with screws (1).
(Ref. Fig. 401)

D. Test
(1)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Make certain that electronics racks ventilation is working.
(3)Remove safety clips and tags and close the circuit breakers opened in step 2. A. (1).
(4)Energize the Passenger Address System (Ref. 23-31-00, P. Block 501).
(5)Energize the Passenger Service System (Ref. 23-38-00, P. Block 501).
(6)Energize the Passenger Reading Light System (Ref. 33-25-00, P. Block 501).
NOTE: The presentation on the MAPSP 51MK display could vary dependant on the MAPSP software.
(7)Make certain the selector switch on the BITE panel, which is behind a cover at the purser's station, is in the NORMAL position and all TEST OK LIGHTS are off.
(8)After installation of the MAPSP, the passenger entertainment systems and the passenger services system must be reset by the following Recall Default Configuration.

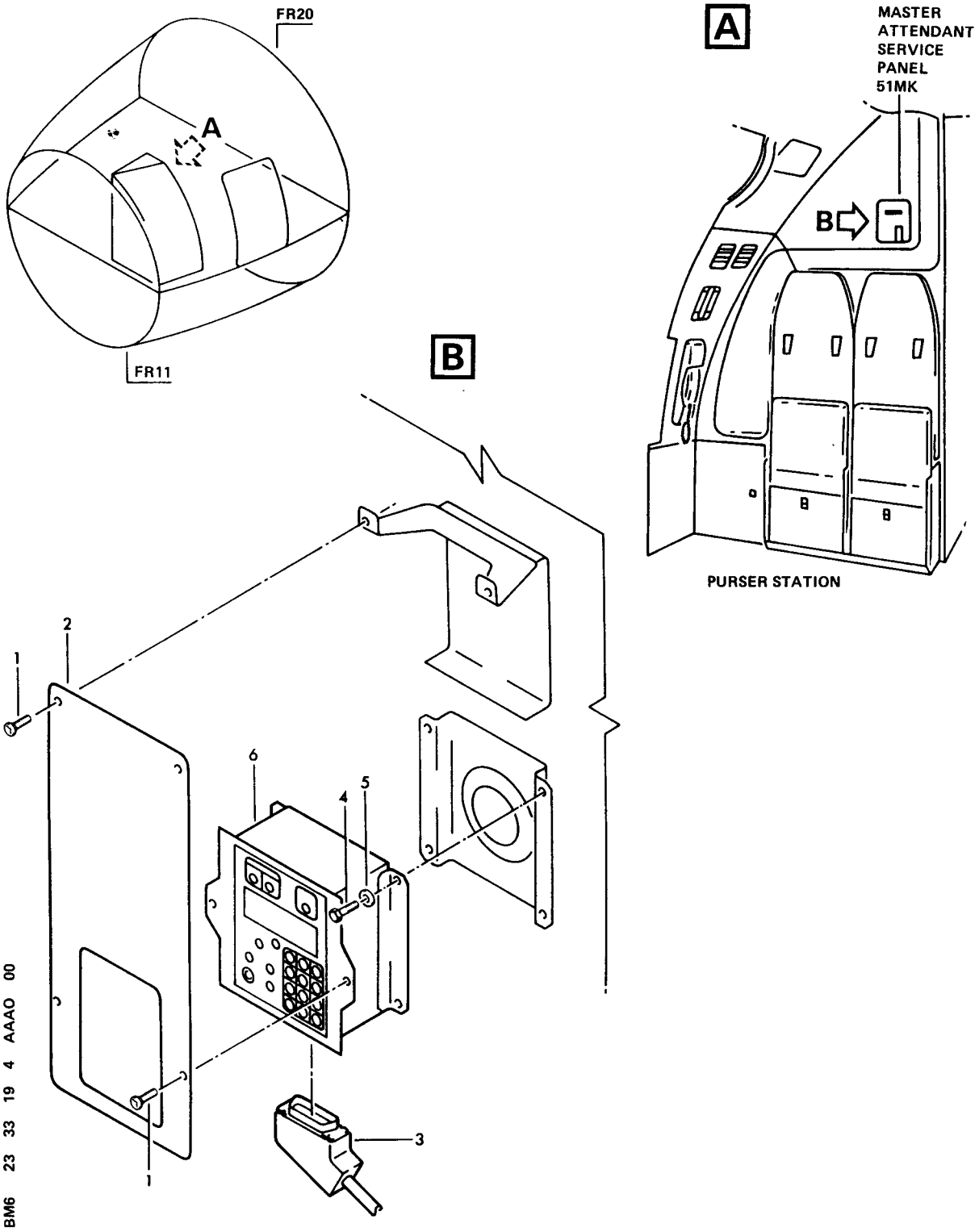
| ACTION | RESULT |
|---|---|
| 1. On MAPSP 51MK, at purser's staion:<br>- press, in sequence, pushbutton switches MODE SELECT, 8, 1, 2, 6 and MODE SELECT.<br>- press, simultaneously, pushbutton switches INITIAL SET and ENTER.<br>- press, simultaneously, pushbutton switches INITIAL SET, RV and CL.<br>- press pushbutton switch MODE SELECT.<br>- press, in sequence, pushbutton switches CL, CL and ENTER.<br>- press, simultaneously, pushbutton switches INITIAL SET and MODE SELECT. | On MAPSP 51MK display:<br>- SEAT CONFIG ZN1 is shown.<br>- ZCU1SYSCOL1RW 01 is shown.<br>- LAYOUT CLR/SET is shown.<br>- ZCU1SYSCOL1RW 01 is shown.<br>- INITIAL SET is shown.<br>- SEAT CONFIG ZN1 is shown. |

| ACTION | RESULT |
|---|---|
| - press pushbutton switch MODE SELECT. | - VIDEO CONFIG ZN1 is shown. |
| - press pushbutton switch MODE SELECT. | - PASSENG CALL ZN1 is shown. |
| - press pushbutton switch MODE SELECT. | - CHIME CONFIG ZN1 is shown. |
| - press pushbutton switch MODE SELECT. | - MASTER CALL ZN1 is shown. |
| - press pushbutton switch MODE SELECT. | - SENDING CONFIG PLEASE WAIT is shown.<br>- the display goes off. |

NOTE: During the following test procedure, after switching between switch positions, all the TEST OK LIGHTS go off.

| | |
|---|---|
| 2. On BITE Panel 12MK: | On BITE Panel 12MK: |
| - set selector switch to the SYSTEM TEST 1 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the LAMP TEST 2 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the NORMAL position. | - all TEST OK LIGHTS go off. |
| - set selector switch to the ODU FWD TEST 3 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the ODU RVS TEST 4 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the SEB FWD TEST 5 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the SEB RVS TEST 6 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the PES TEST 7 position. | - all TEST OK LIGHTS come on. |
| - set selector switch to the NORMAL position. | - all TEST OK LIGHTS go off. |

E. Close-Up
(1)De-energize the Passenger Address System (Ref. 23-31-00, P. Block 501).
(2)De-energize the Passenger Service System (Ref. 23-38-00, P. Block 501).
(3)De-energize the Passenger Reading Light System (Ref. 33-25-00, P. Block 501).
(4)De-energize electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).
(5)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.




Master Attendant Passenger Service Panel
Figure 401

**ON A/C 001-100,

1. General
The Passenger Entertainment (Video) System (PES-video) provides pre-recorded video programs through the monitors to the passenger compartments.
The audio video program is given through Passenger Entertainment (Music) System (PES-music), to the Passenger Control Unit (PCU), or through the Passenger Addrress (PA) system.

**ON A/C 101-200,

1. General
The passenger entertainment (video) system provides pre-recorded video programs via projectors and monitors throughout the passenger compartments.
After amplification, the audio for the video programs is sent to the passenger entertainment (music) system for distribution over the loudspeakers and/or individual passenger seat control units.

**ON A/C ALL

2. Component Location

**ON A/C 001-100,

(Ref. Fig. 001)

R **ON A/C 105-200,

R (Ref. Fig. 002)

R **ON A/C 101-104,

(Ref. Fig. 003)

R **ON A/C 105-200,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 93MM1 | UNIT - VIDEO DISTRIBUTION | | 230 | | |
| 93MM2 | UNIT - VIDEO DISTRIBUTION | | 230 | | |
| 95MM2 | 8.6 inch LCD MONITOR | | 222 | | 23-36-14 |
| 95MM3 | 8.6 inch LCD MONITOR | | 221 | | 23-36-14 |

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 95MM4 | 8.6 inch LCD MONITOR | | 232 | | 23-36-14 |
| 95MM5 | 8.6 inch LCD MONITOR | | 231 | | 23-36-14 |
| 901MM | RELAY - AUDIO VIDEO ZONE A/B | 90VU | 122 | 121BL | |
| 902MM | RELAY - AUDIO VIDEO ZONE AB/C | 90VU | 122 | 121BL | |
| 903MM | RELAY - AUDIO VIDEO/ANNOUNCEMENT | 90VU | 122 | 121BL | |
| M1001 | UNIT - SYSTEM CONTROL | | 221 | | 23-36-21 |
| M1021 | REPRODUCER - VIDEO TAPE | | 221 | | 23-36-22 |
| M1022 | REPRODUCER - VIDEO TAPE | | 221 | | 23-36-22 |
| M1023 | REPRODUCER - VIDEO TAPE | | 221 | | 23-36-22 |
| M1082 | UNIT - VIDEO DISTRIBUTION | | 230 | | |
| M1083 | UNIT - VIDEO DISTRIBUTION | | 240 | | |
| M1084 | UNIT - VIDEO DISTRIBUTION | | 250 | | |
| M1111 | PROJECTOR - VIDEO | | 230 | | 23-36-11 |
| M1112 | PROJECTOR - VIDEO | | 230 | | 23-36-11 |
| M1123 | MONITOR | | 240 | | 23-36-13 |
| M1124 | MONITOR | | 250 | | 23-36-13 |

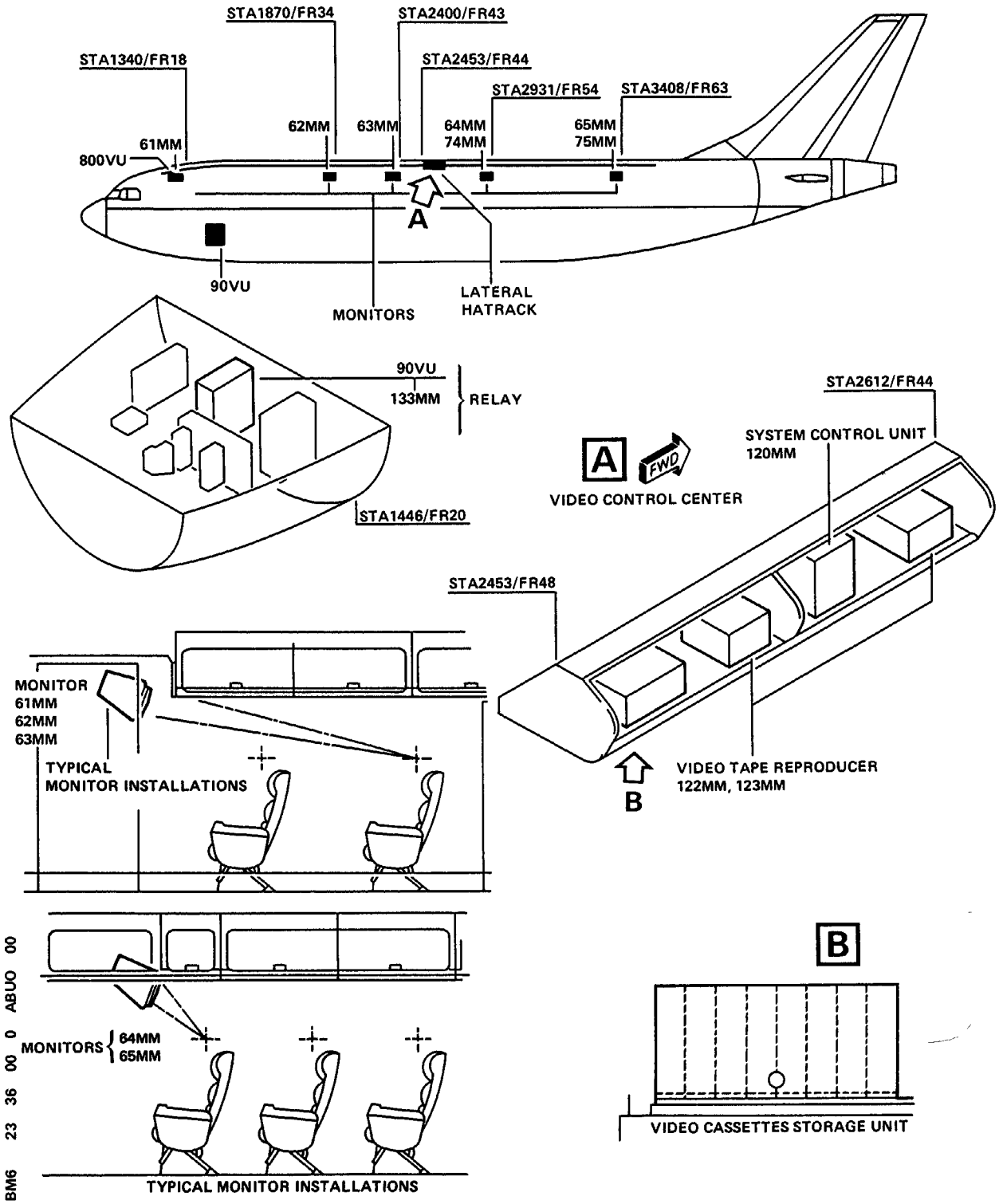
**ON A/C 001-100,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 61MM | MONITOR | | 230 | | |
| 62MM | MONITOR | | 230 | | |
| 63MM | MONITOR | | 240 | | |
| 64MM | MONITOR | | 240 | | |
| 65MM | MONITOR | | 250 | | |
| 74MM | RETRACTION MECAHNISM | | 240 | | |
| 75MM | RETRACTION MECHANISM | | 250 | | |
| 120MM | SYSTEM CONTROL UNIT | | 240 | | |
| 122MM | VIDEO TAPE REPRODUCER (VTR) 1 | | 240 | | |
| 123MM | VIDEO TAPE REPRODUCER (VTR) 2 | | 240 | | |
| 133MM | RELAY | 90VU | 122 | | |

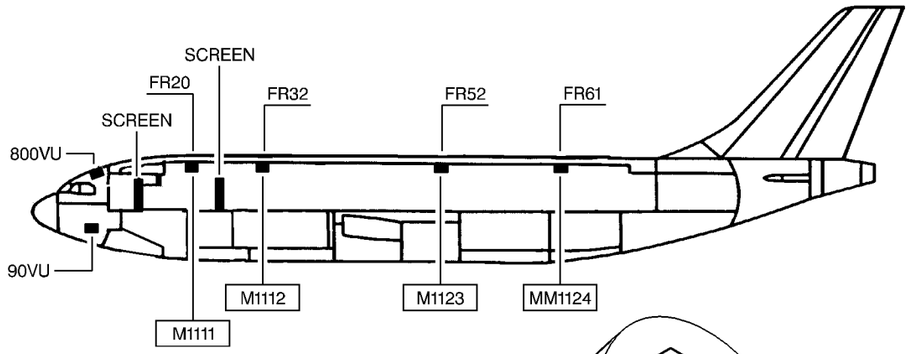
**ON A/C 101-104,

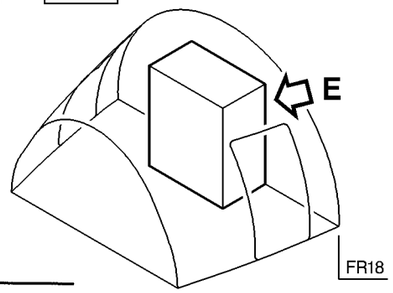
| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 901MM | RELAY - AUDIO VIDEO ZONE A/B | 90VU | 122 | 121BL | |
| 902MM | RELAY - AUDIO VIDEO ZONE AB/C | 90VU | 122 | 121BL | |
| 903MM | RELAY - AUDIO VIDEO/ANNOUNCEMENT | 90VU | 122 | 121BL | |
| M1001 | UNIT - SYSTEM CONTROL | | 221 | | 23-36-21 |
| M1021 | REPRODUCER - VIDEO TAPE | | 221 | | 23-36-22 |
| M1022 | REPRODUCER - VIDEO TAPE | | 221 | | 23-36-22 |
| M1023 | REPRODUCER - VIDEO TAPE | | 221 | | 23-36-22 |

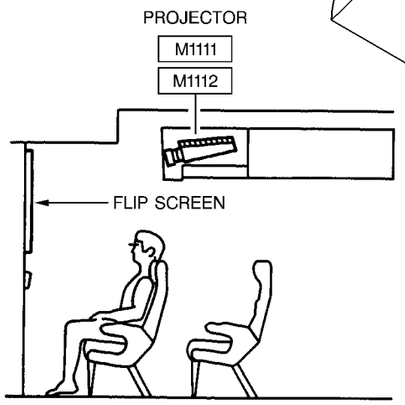
| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| M1081 | UNIT - VIDEO DISTRIBUTION | | 230 | | |
| M1082 | UNIT - VIDEO DISTRIBUTION | | 230 | | |
| M1083 | UNIT - VIDEO DISTRIBUTION | | 240 | | |
| M1084 | UNIT - VIDEO DISTRIBUTION | | 250 | | |
| M1111 | PROJECTOR - VIDEO | | 230 | | 23-36-11 |
| M1112 | PROJECTOR - VIDEO | | 230 | | 23-36-11 |
| M1121 | 8.6 inch LCD MONITOR | | 232 | | 23-36-14 |
| M1122 | 8.6 inch LCD MONITOR | | 231 | | 23-36-14 |
| M1123 | MONITOR | | 240 | | 23-36-13 |
| M1124 | MONITOR | | 250 | | 23-36-13 |



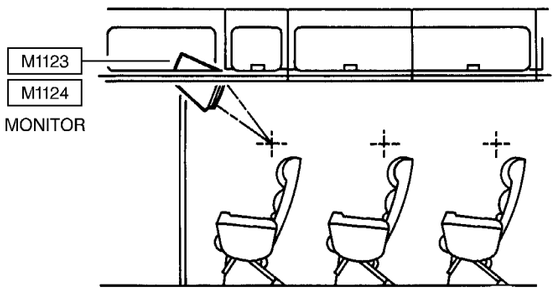

Passenger Entertainment - Video
Location
Figure 001

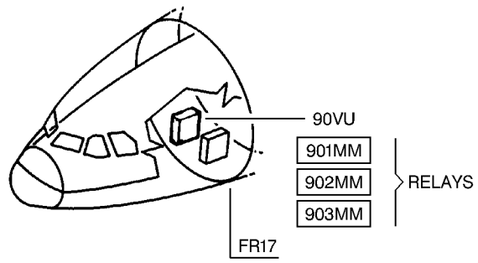


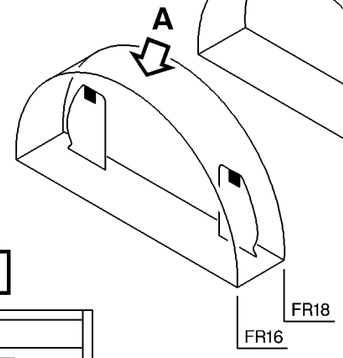



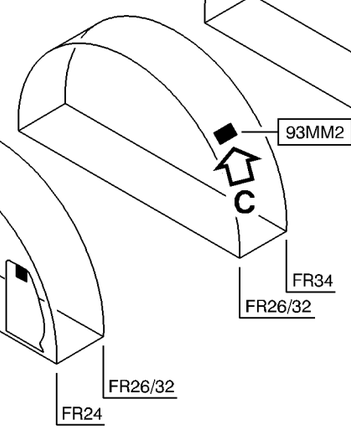



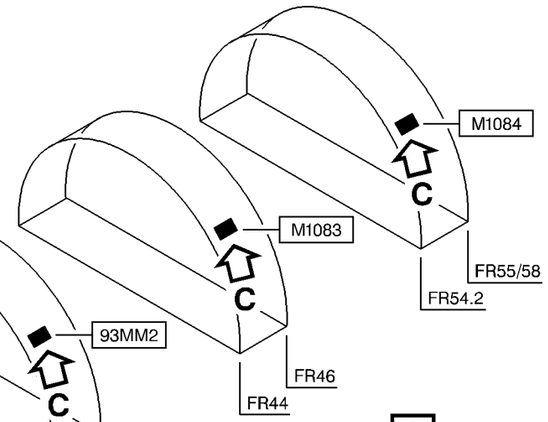

TYPICAL MONITOR INSTALLATIONS

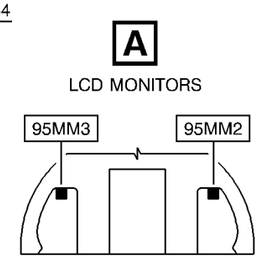


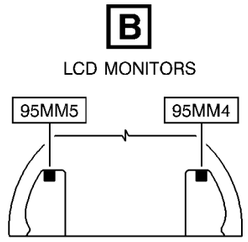



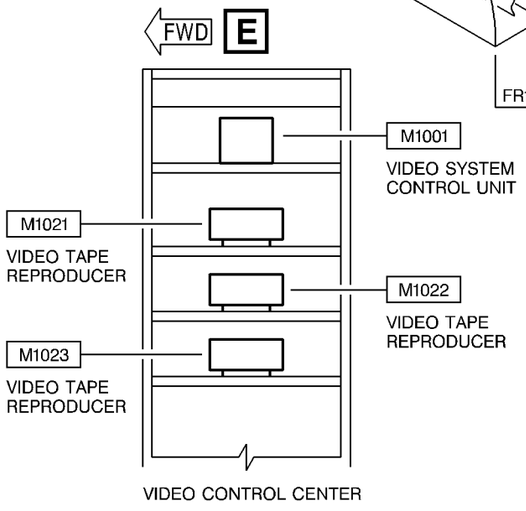



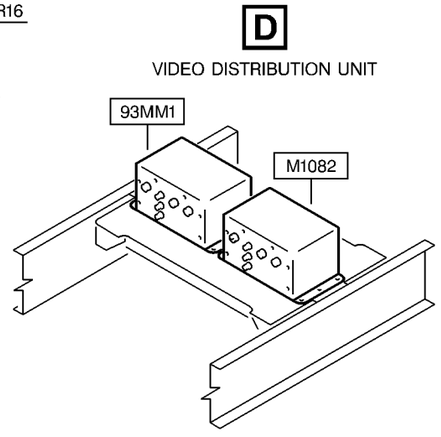



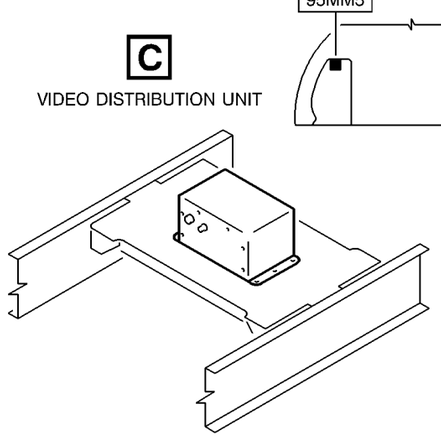




BM6 23 36 00 0 ACH0 00

Passenger Entertainment (Video)
Component Location
Figure 002

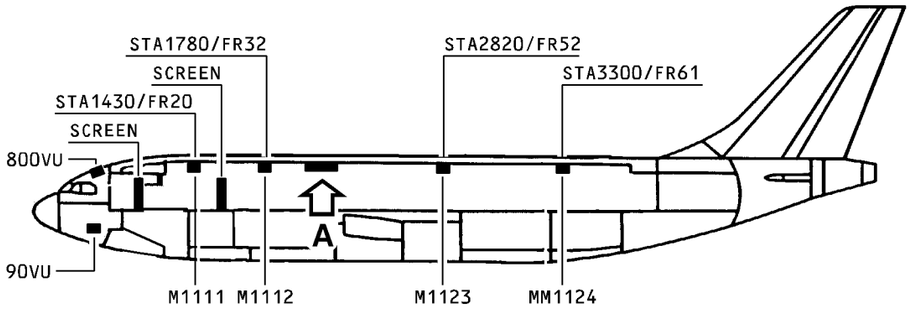
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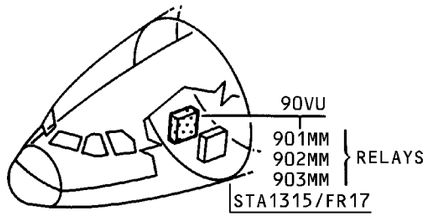
R EFFECTIVITY: 105-200,

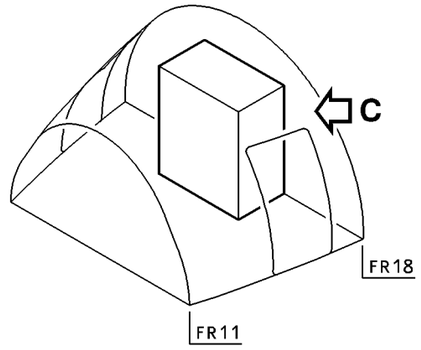
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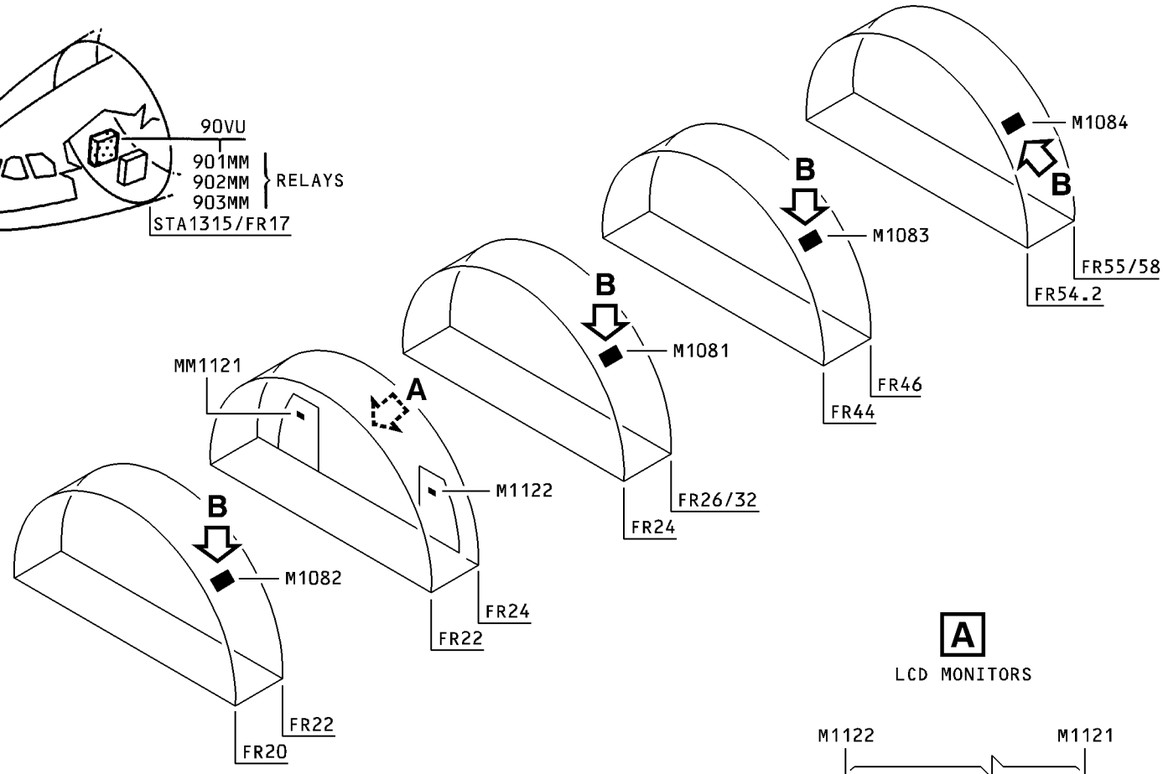


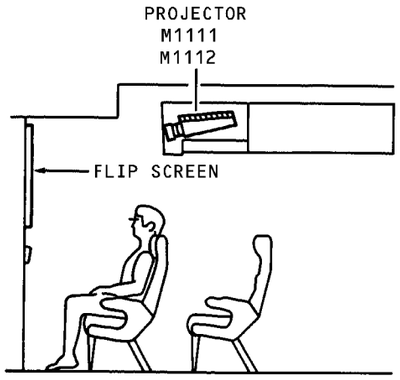
Printed in France

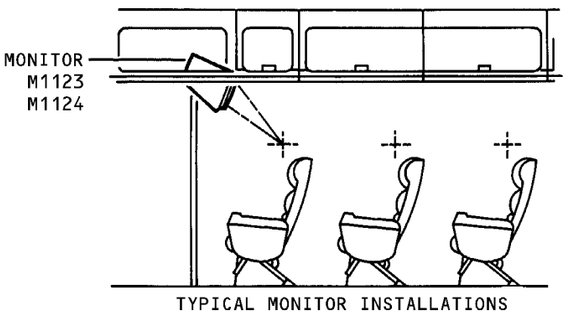


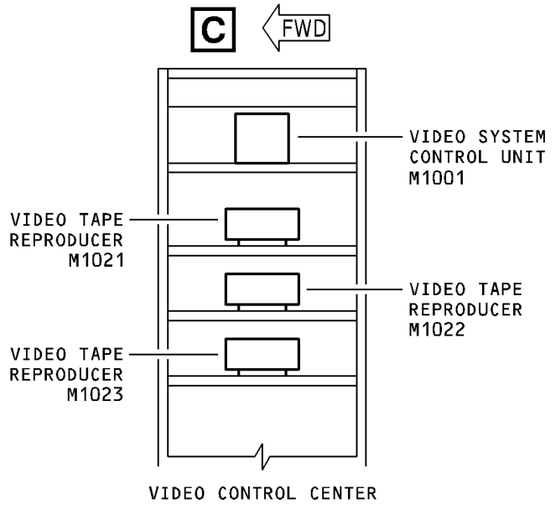



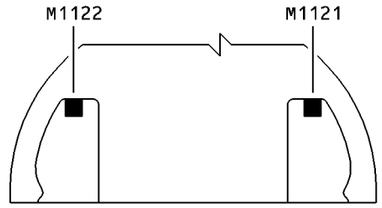




TYPICAL MONITOR INSTALLATIONS

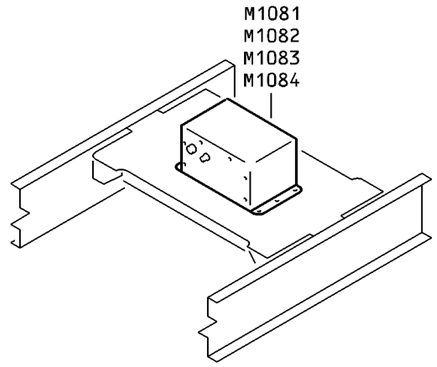



VIDEO CONTROL CENTER

A
LCD MONITORS




B
VIDEO DISTRIBUTION UNIT




BM6 23 36 00 0 MFB0 00

Passenger Entertainment (Video)
Component Location
Figure 003

R EFFECTIVITY: 101-104,

PIA



Printed in France

**ON A/C 001-100,

3. System Description
The following major units comprise the video system:
- one 16 inch monitor installed in galley 1C.
- one 16 inch monitor installed in galley 2.
- one 16 inch monitor installed in the center stowage compartment.
- two monitor modules installed in the center overhead compartment, each containing a 16 inch monitor with retracting mechanism.
- two Video Tape Reproducers (VTR) installed in the control center in the mid. lateral hatrack LH.
- one System Control Unit (SCU) in the control center.

Pre-recorded programs, stored on video tape cassettes, are switched through the SCU from the VTR to the monitors.The program pictures can be viewed by the passengers on the monitor screens in each viewing zone.
The audio video program is normally distributed through the PES-music.
The audio video program can be heard through pneumatic or electric headsets, which are connected to the PCU's.
The audio video program can additional distributed through the PA-system.

R **ON A/C 101-104,

3. System Description
The passenger entertainment (video) system uses these major components:
- two video projectors, installed in the center overhead compartment.
- two monitor modules installed in the center overhead compartment, each monitor module contains a 16 inch monitor and a monitor retraction mechanism.
- two LCD monitors installed in the rear wall of partitions.
- three video tape reproducers (VTR) installed in a video control center.
- one system control unit (SCU) installed in a video control center.

Pre-recorded programs, stored on video tape cassettes, are switched thru the system control unit from the three tape reproducers to the projectors, the LCD monitors and the overhead monitors.
The program pictures are viewed by the passengers on flip screens onto which the pictures from the projectors are projected. The video program is also viewed on the LCD monitors and the overhead monitors. The audio video program is distributed via the passenger entertainment (music) system and is heard through electric or pneumatic headsets. These headsets are connected to the passenger control units. When selected, the audio video program is also distributed through the passenger address system.

R **ON A/C 105-200,

R 3. System Description
R The passenger entertainment (video) system uses these major components:
R - two video projectors, installed in the center overhead compartment.

R - two monitor modules installed in the center overhead compartment, each
R monitor module contains a 16 inch monitor and a monitor retraction
R mechanism.
R - four LCD monitors installed in the rear wall of partitions.
R - three video tape reproducers (VTR) installed in a video control center.
R - one system control unit (SCU) installed in a video control center.
R Pre-recorded programs, stored on video tape cassettes, are switched thru
R the system control unit from the three tape reproducers to the projectors,
R the LCD monitors and the overhead monitors.
R The program pictures are viewed by the passengers on flip screens onto which
R the pictures from the projectors are projected. The video program is also
R viewed on the LCD monitors and the overhead monitors. The audio video program
R is distributed via the passenger entertainment (music) system and is heard
R through electric or pneumatic headsets. These headsets are connected to the
R passenger control units. When selected, the audio video program is also
R distributed through the passenger address system.

**ON A/C 001-100,

4. Component Description

A. Visual Display
(1)Monitor
(a)Fixed Monitors
One monitor is mounted in a fixed position in gally 1C;
one monitor in gally 2 and one monitor in the center stowage
compartment. Control potentiometers for the color, brightness,
hue, vertical hold and contrast are provided in front of the monitors.
The monitors are switching off individual, by depressing the power
off switch on the rear of the monitors.
(b)Retractable Monitors
The other monitors are mounted in a specially strengthened
container in the center overhead compartment. The monitors are
moved electrically into the viewing and stowed positions by a retrac-
tion mechanism. In the stowed position the monitors are fully retrac-
ted into the center hatrack column. Control potentiometers for color,
brightness, hue, vertical hold and contrast are provided in front
of the monitors.The monitors are switching off individual, by
depressing the power off switch on the rear of the monitors.

**ON A/C 101-200,

4. Component Description

A. Visual Display
(1)Video Projector
The three gun projectors are mounted in a specially strengthened and
modified containers in the center overhead stowage compartment in the
forward and mid passenger compartments. Three chromatic cathode ray tubes

(red, green and blue) and acryl lenses are used to project video images onto the flip screen. Control potentiometers for convergence, color, contrast, hue and electrical focus adjustments are provided on the projector. A hinged door on the bottom of the projector housing allows access to the primary adjustment controls, the convergence control potentiometers and the electronic circuits contained within the housing. The lenses are optically focused individually by rotating the lens housing in the required direction.
An internal 'Hatch' generator, which produces a cross hatched pattern onto the video screen when switched on, allows convergence adjustments of the three monochromatic tubes.
Program selection and projector on/off switching is made by depressing the respective pushbutton switches on the SCU.
Electrical interface with the system is thru two connectors on the rear of the projector housing.

(2)Flip Screen

Two flip screens are installed. One screen is installed on the rear wall of galley F2/C1, the other screen is installed on a partition in the mid passenger compartment
The flip screen is made up of three parts as follows:
- A mounting frame secures the screen to the mounting surface,
- An outer frame hinged at the top of the mounting frame pivots the viewing surface into use. A locking device is located on the outer lower edge of the frame,
- The viewing section can be flipped over either to the viewing or stowed position. The viewing surface is made of reinforced fiberglass vinyl. The viewing area is framed by a matt black mask which conceals any scanning lines at the edge of the projected picture.
  A decorative material is fitted to the back of the viewing section.

(3)Retractable Monitor

The 16 inch retractable monitors are mounted in specially strengthened containers in the center overhead compartment in the aft passenger compartment.
The monitors are moved into the viewing position and the stowed position by an electrically operated retraction mechanism. In the stowed position the monitors are retracted fully into the center hatrack column. On the front panel of each monitor are controls for vertical hold, brightness, hue, color and contrast. Program selection and on/off switching of the monitors is controlled remotely from the video system control unit. Each monitor can be switched off individually with a PWR OFF switch located on the rear panel of the monitor. Also on the rear panel of each monitor is a PWR IND light. This light is illuminated when electrical power is supplied to the monitor. Electrical interface connectors are installed on the rear panel of the monitor housing.

(a)Retraction Assembly

The retraction mechanism is used to move a retractable video monitor into the viewing or stowed position. The video monitor is moved electrically into the viewing position when selected on the video system control unit. The video monitor moves automatically into the stowed position when:
- an loss of electrical power occurs for more than 200 ms,

- a rapid cabin decompression occurs,
- mechanical resistance is felt while the retraction mechanism is moving the video monitor into the viewing position.

R **ON A/C 101-104,

(4)LCD Monitor
The system uses two 8.6 inch LCD monitors installed in partitions located in the forward section of the mid passenger compartment.
On the front panel of the LCD monitor there is a power on/off P/BSW and two brightness P/BSWs (+ and -). The + P/BSW increases the brightness of the LCD monitor screen and the - P/BSW decreases the brightness of the LCD monitor screen. On the top panel of the LCD monitor are the electrical connectors, an elapsed time indicator (ETI) and a load switch. The ETI indicates, in hours, the time the LCD monitor has been switched on. The load switch, when in the on position, applies a 50 ohm load to the video input.
When installed in the aircraft, the LCD monitor has a protective cover.

R **ON A/C 105-200,

R (4)LCD Monitor
R The system uses four 8.6 inch LCD monitors installed in partitions
R located in the forward section of the mid passenger compartment.
R On the front panel of the LCD monitor there is a power on/off P/BSW and
R two brightness P/BSWs (+ and -). The + P/BSW increases the brightness
R of the LCD monitor screen and the - P/BSW decreases the brightness of the
R LCD monitor screen. On the top panel of the LCD monitor are the
R electrical connectors, an elapsed time indicator (ETI) and a load switch.
R The ETI indicates, in hours, the time the LCD monitor has been switched
R on. The load switch, when in the on position, applies a 50 ohm load to
R the video input.
R When installed in the aircraft, the LCD monitor has a protective cover.

R **ON A/C 101-200,

(Ref. Fig. 004)
(Ref. Fig. 005)

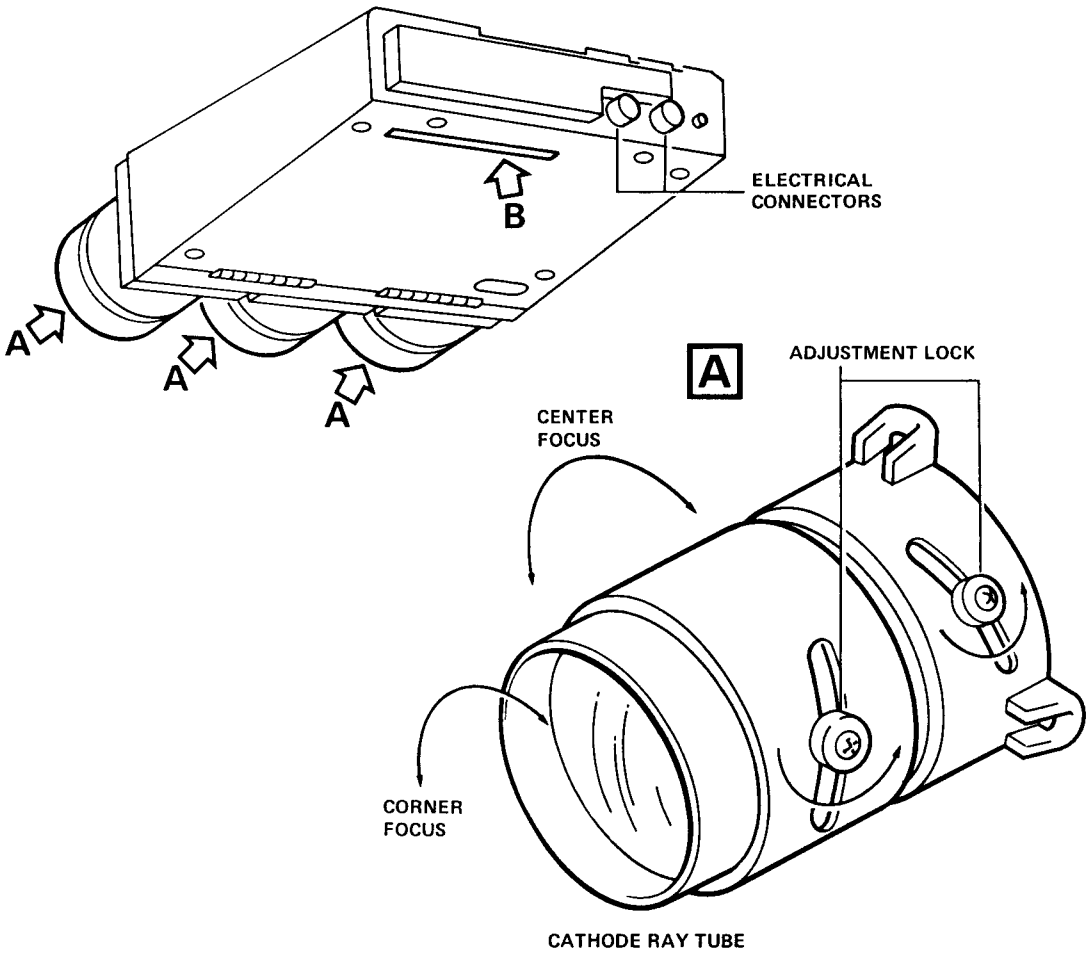
**ON A/C 001-100,

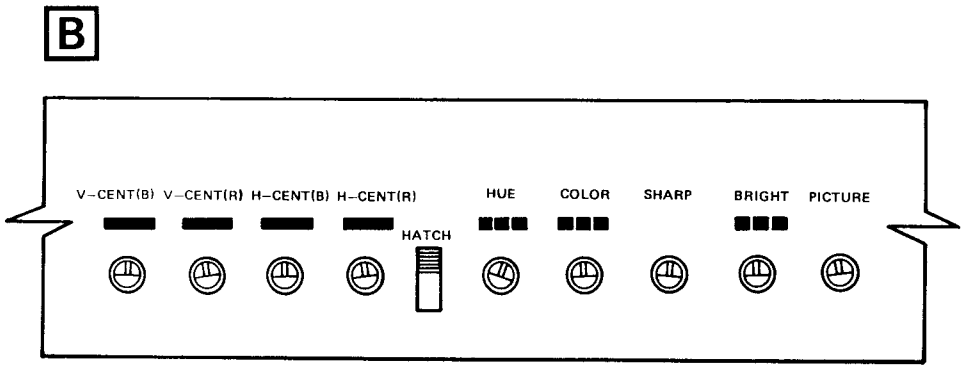
(Ref. Fig. 006)

**ON A/C 101-200,

(Ref. Fig. 008)
(Ref. Fig. 009)

**ON A/C 001-100,



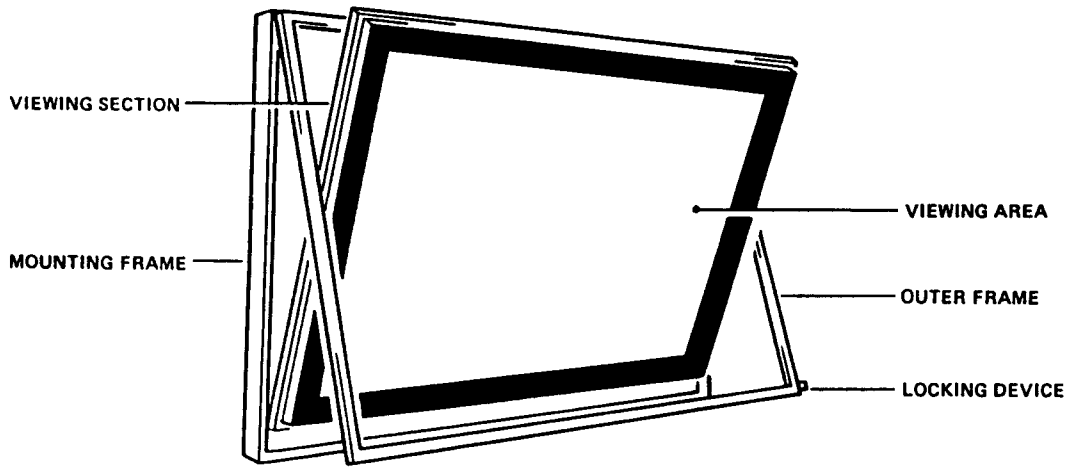




EXTERNAL
ADJUSTMENT CONTROL
PANEL

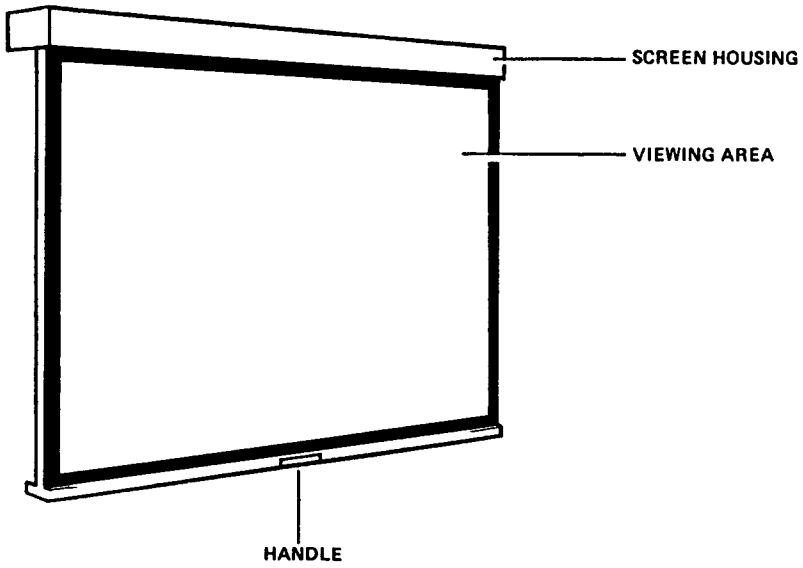
BM6 23 36 00 0 ADDO 01

Video Projector
Figure 004

FLIP VIDEO SCREEN

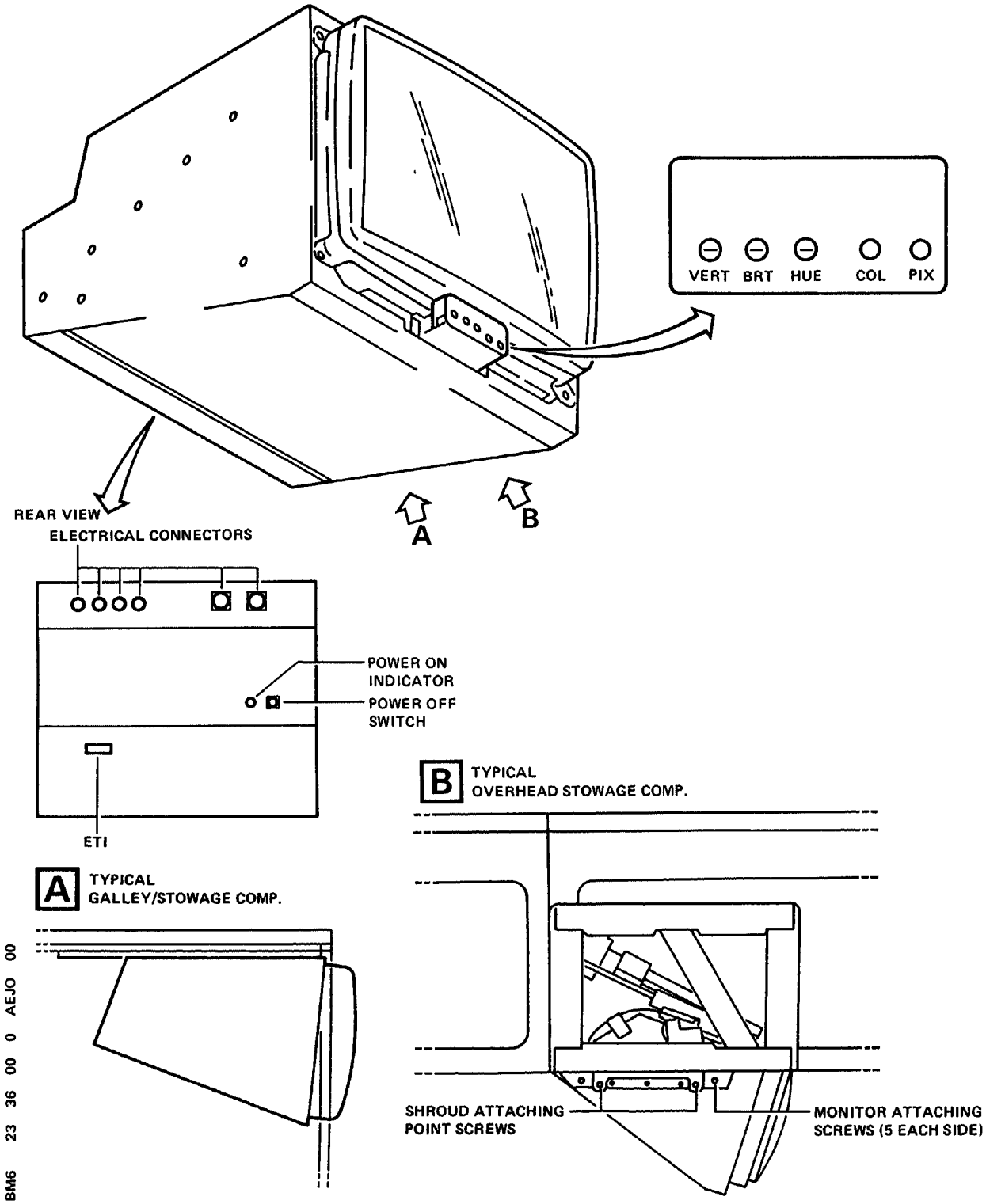



ROLL–DOWN VIDEO SCREEN

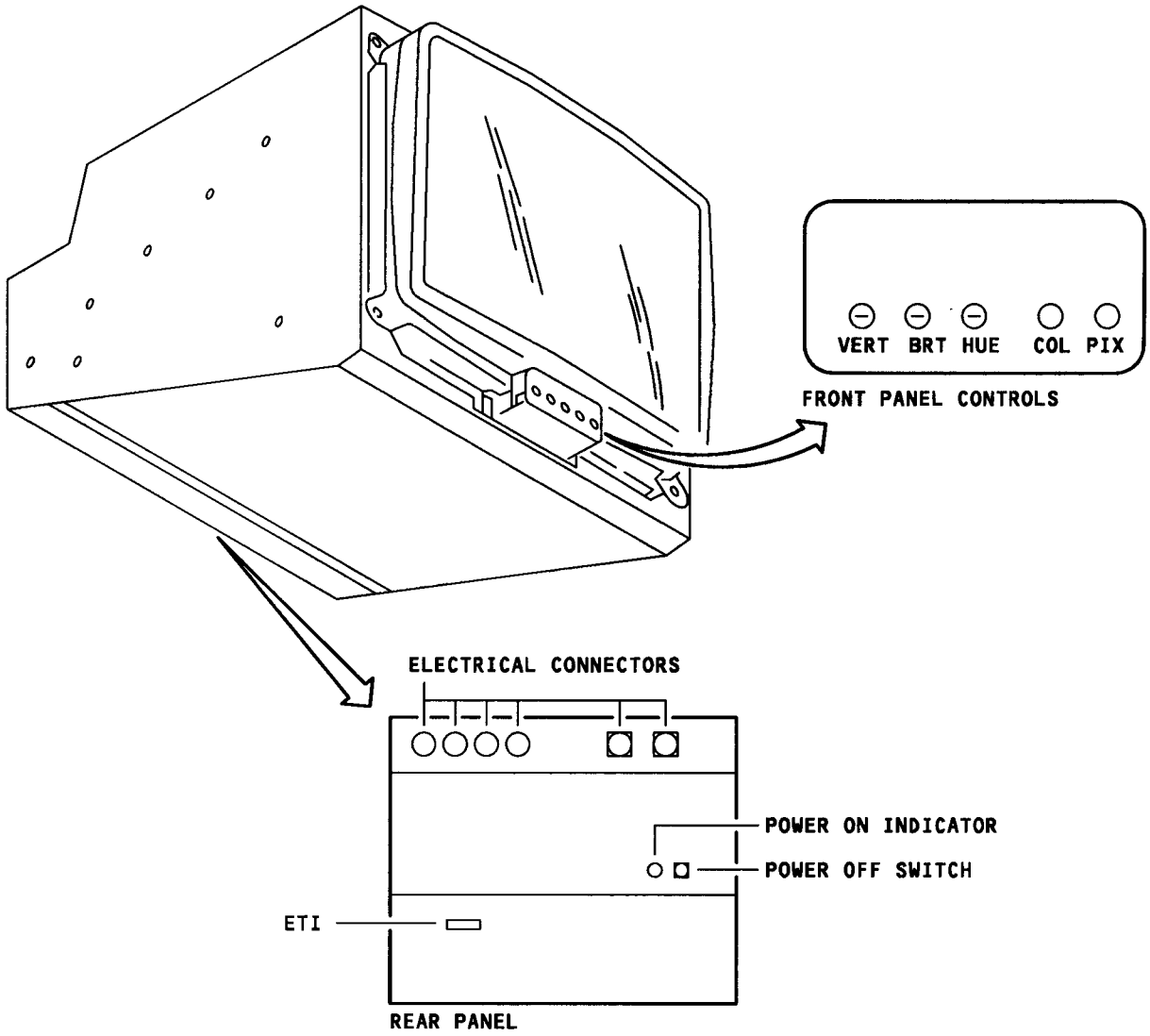



BM6 23 36 00 0 AGD0 00

Video Screen
Figure 005

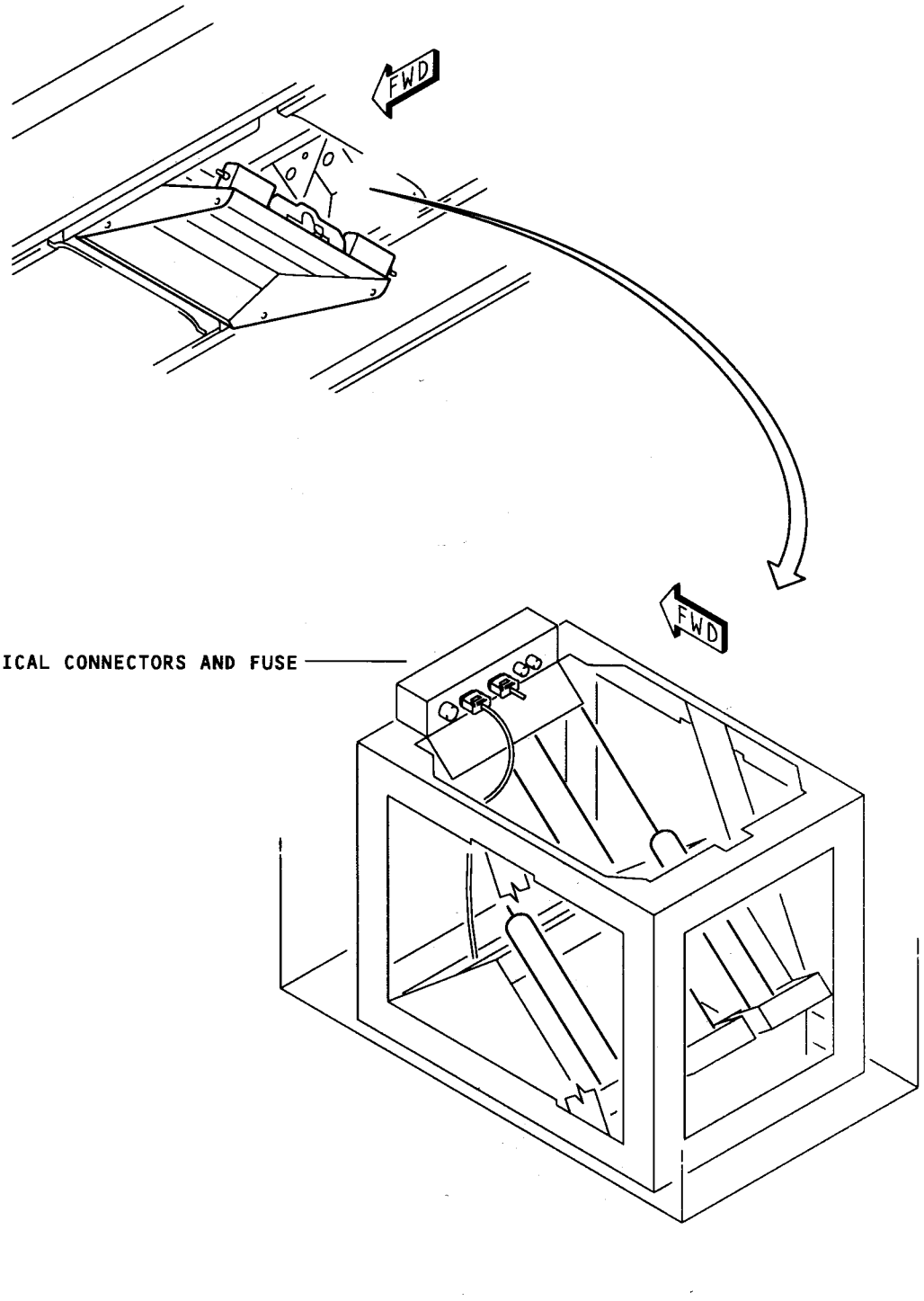



Video Monitor
Figure 006



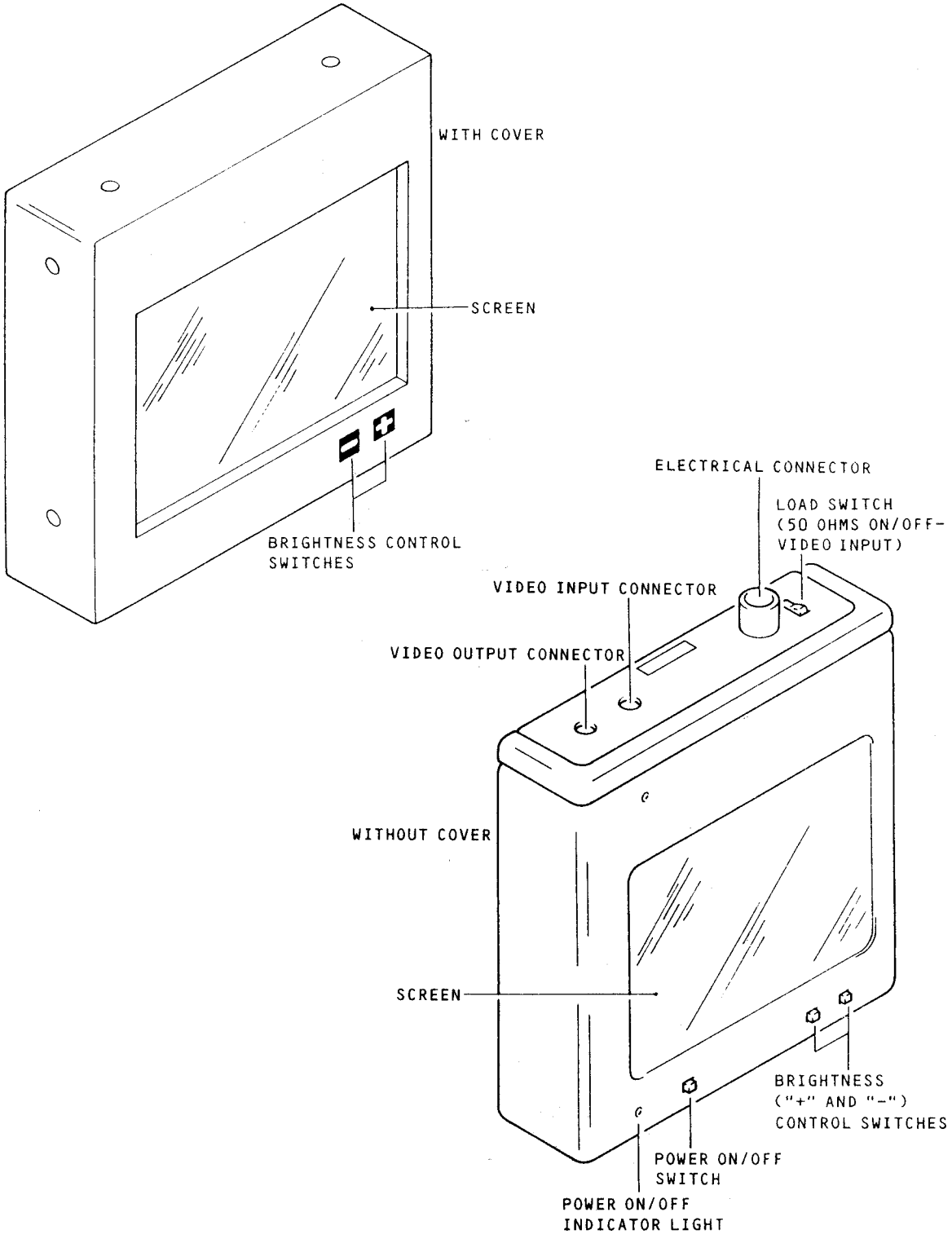

BM6 23 36 00 0 AERO 00

Video Monitor
Figure 007




BM6 23 36 00 0 MEA0 00

Retraction Assembly
Figure 008




BM6 23 36 00 0 AFA0 01

LCD Monitor
Figure 009

B. Video Tape Reproducer (VTR)

On the front face of the VTR the following are located:
- pushbutton control switches, REW (rewind), PLAY, FF (fast forward)
- EJECT and STOP button
- STANDBY/ON indicator
- cassette access door
- a mode selector switch(NTSC 4.43, CCIR, PAL)
- an elapsed time indicator
- a tracking adjustment knob
- a tape counter
- a tape counter reset pushbutton

(1)The VTR is a compact, lightweight, front loading cassette reproducer with dual channel audio output.
A high density 1/2 width VHS cassette tape, with two magnetic audio sound tracks, for dual language or stereo programming, is used to provide up to approximately 120 minutes of pre-recorded video entertainment.
The VTR uses a helical scanning playback system with 4 rotary heads and has a tape speed of 2 cm/sec. with a cassette rewind or fast forward time of less than 4 min. and automatic rewind.
A tracking adjustment knob is used to adjust an incorrectly recorded tape. This is necessary to get an interference free pictures.
TV-System select switch is used to accomodate the following video signal color formats:
- PAL
- NTSC 4.43.

**ON A/C 101-200,

B. Video Tape Reproducer (VTR)

The VTR is a compact, lightweight, front loading cassette recorder with dual channel audio output.
A high density 1/2 inch width VHS cassette tape, with two magnetic audio sound tracks for dual language or stereo programs is used. The cassette tape provides up to approximately 120 minutes of pre-recorded video entertainment.
Six momentary-action pushbutton switches (P/BSW), used for direct manual control of the VTR, are located on the front panel of the VTR. These switches are:
- a lighted POWER P/BSW
- an EJECT P/BSW
- a lighted STOP P/BSW
- a lighted REW (rewind) P/BSW
- a lighted PLAY P/BSW
- a lighted FF (fast forward) P/BSW

A STBY indicator light is also located on the front panel of the VTR. Above the switches is an access door for loading the video cassette cartridge.
The VTR plays either VHS or S-VHS cassettes of NTSC format. The mode of operation and tape format is detected automatically. The VTR provides one composite color video output signal and two audio output signals.
Normal control of the VTR is done from the video system control unit. A

bidirectional data line connects the VTR with the video system control unit. The video system control unit sends commands to the VTR and receives responses from the VTR along the data line. The normally used commands from the video system control unit are:
- a power on/off command.
- an operational mode control command.
- a program search command.
- an interrogation command.

The interrogation command is used to obtain the on/off status, the current operational mode, the search status and the sound key data from the VTR.
An electrical interface connector is located on the rear panel of the VTR.

**ON A/C 001-100,

(Ref. Fig. 010)

**ON A/C 101-200,

(Ref. Fig. 011)

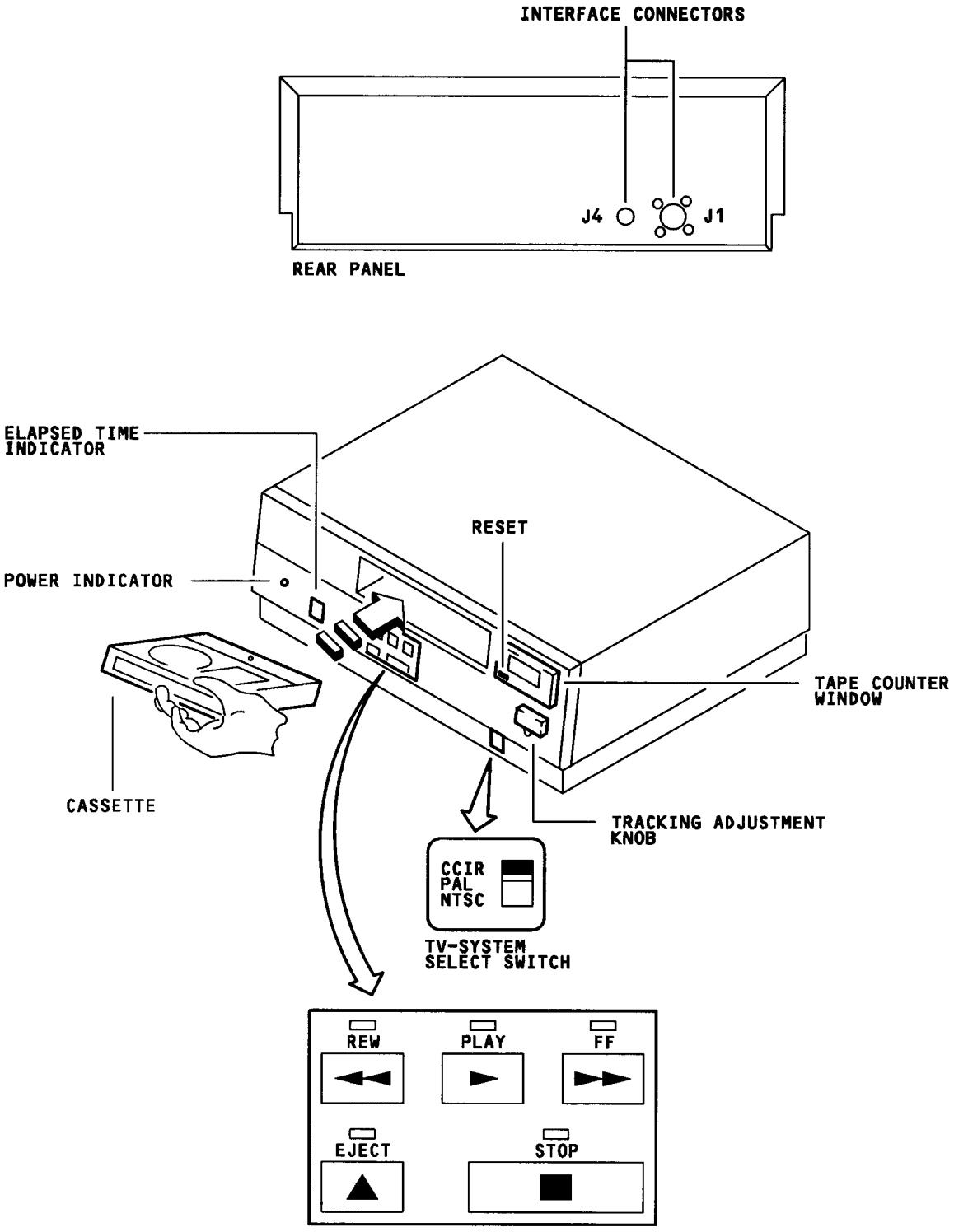
**ON A/C 001-100,

C. System Control Unit (SCU)
The SCU provides system control and interface to the aircraft power supply, the passenger entertainment system (PES), the passenger address (PA) system and the passenger oxygen system.
Pushbutton switches on the front panel provide for the following functions:
- ON/OFF power switching of the system
- ZONE PWR ON/OFF switching of all monitors in each respective video zone
- program source selection for each zone
- tape channel selection when the PA system is selected for the distribution of the video program sound.
- one rotary switch, PA, enables PA selection and volume control.

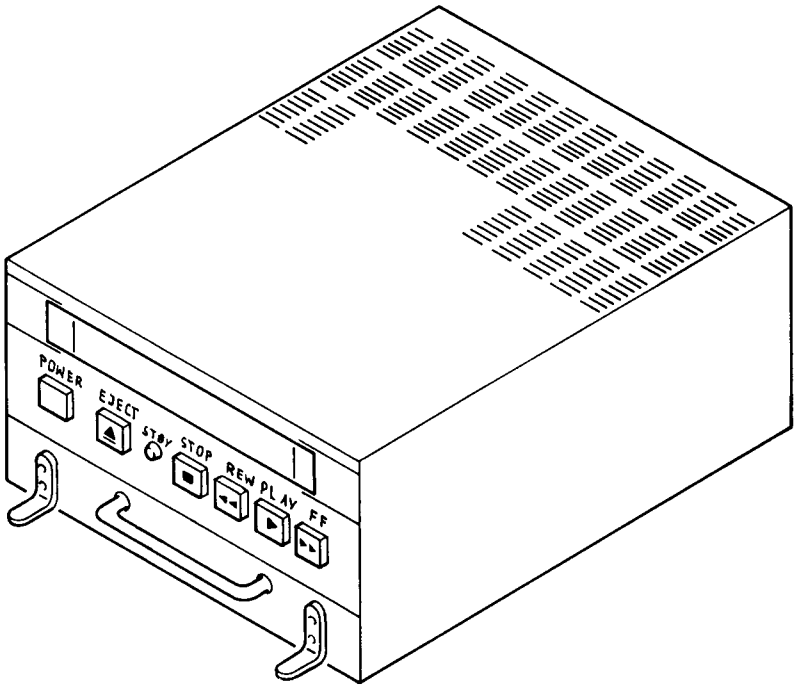
An electric headset connector and a selector switch in conjunction with the control monitor, enable monitoring of programs from each tape reproducer. The SCU amplifies the audio input from the VTRs and distributes the amplified signals to the selected zones via the PES. The audio output can also be distributed to the PA amplifier for broadcast over the PA system loudspeakers.
An elapsed time indicator is also fitted on the face of the SCU. Electrical interface connectors and protection fuses are installed on the back panel.

**ON A/C 101-200,

C. System Control Unit
The SCU is used as the controller for the passenger entertainment (video) system. Control of the video system includes:
- selection of passenger compartment zones for the video display.




Video Tape Reproducer
Figure 010




BM6 23 36 00 0 AHSO 00

Video Tape Reproducer
Figure 011

- selection of the video source for one or more of the selected zones.
- control of the selected video sources.

The SCU is also used as an interface between the passenger entertainment (video) system and:
- the passenger entertainment (music) system.
- the passenger address (PA) system.

On the front panel of the SCU are:
- a SYST PWR P/BSW (applies the primary power to the SCU).
- an LCD monitor screen which is also a touch switch panel.
- a MONITOR headset jack.
- a BRIGHT rotary control (varies the brightness of the LCD screen).
- an ENTER EXEC P/BSW (permits execution of previously entered commands).
- an ENTER PREV P/BSW (used to preview and preselect VTR programs).
- an ENTER MENU P/BSW (calls up a menu on the LCD screen).
- a PA VOLUME MIN/MAX rotary control (controls the audio level of the preselected PA channel output).
- a PA CHANNEL 1/2 rotary switch (selects the audio channel from the selected VTR for broadcast over the PA system).

Monitoring of the audio and video programs from the VTR is done by using the headset jack and the LCD screen.
The SCU amplifies the audio inputs from the VTRs and distributes the amplified signals to the passenger control units thru the passenger entertainment (music) system.
Electrical interface connectors are installed on the rear panel of the SCU.

**ON A/C 001-100,

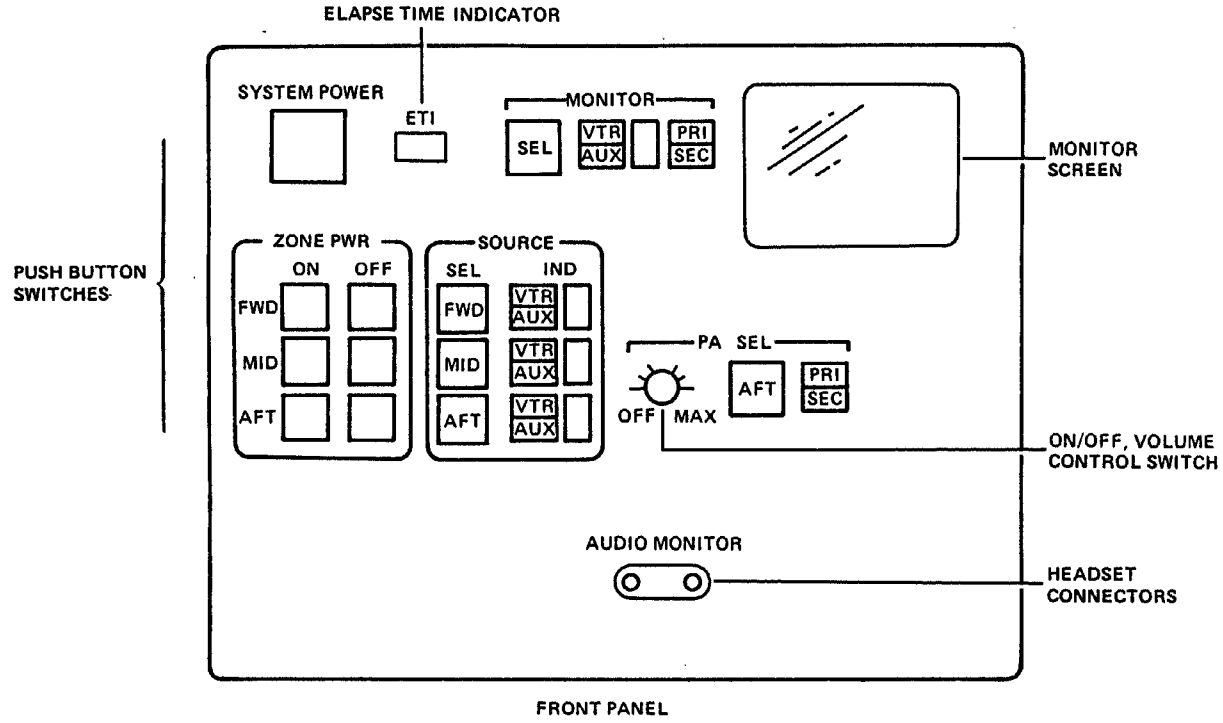
(Ref. Fig. 012)

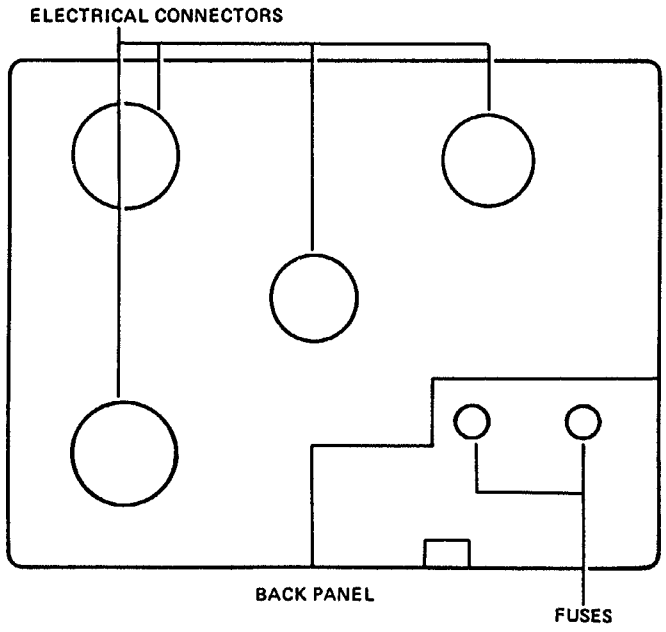
**ON A/C 101-200,

(Ref. Fig. 013)

D. Video Distribution Unit

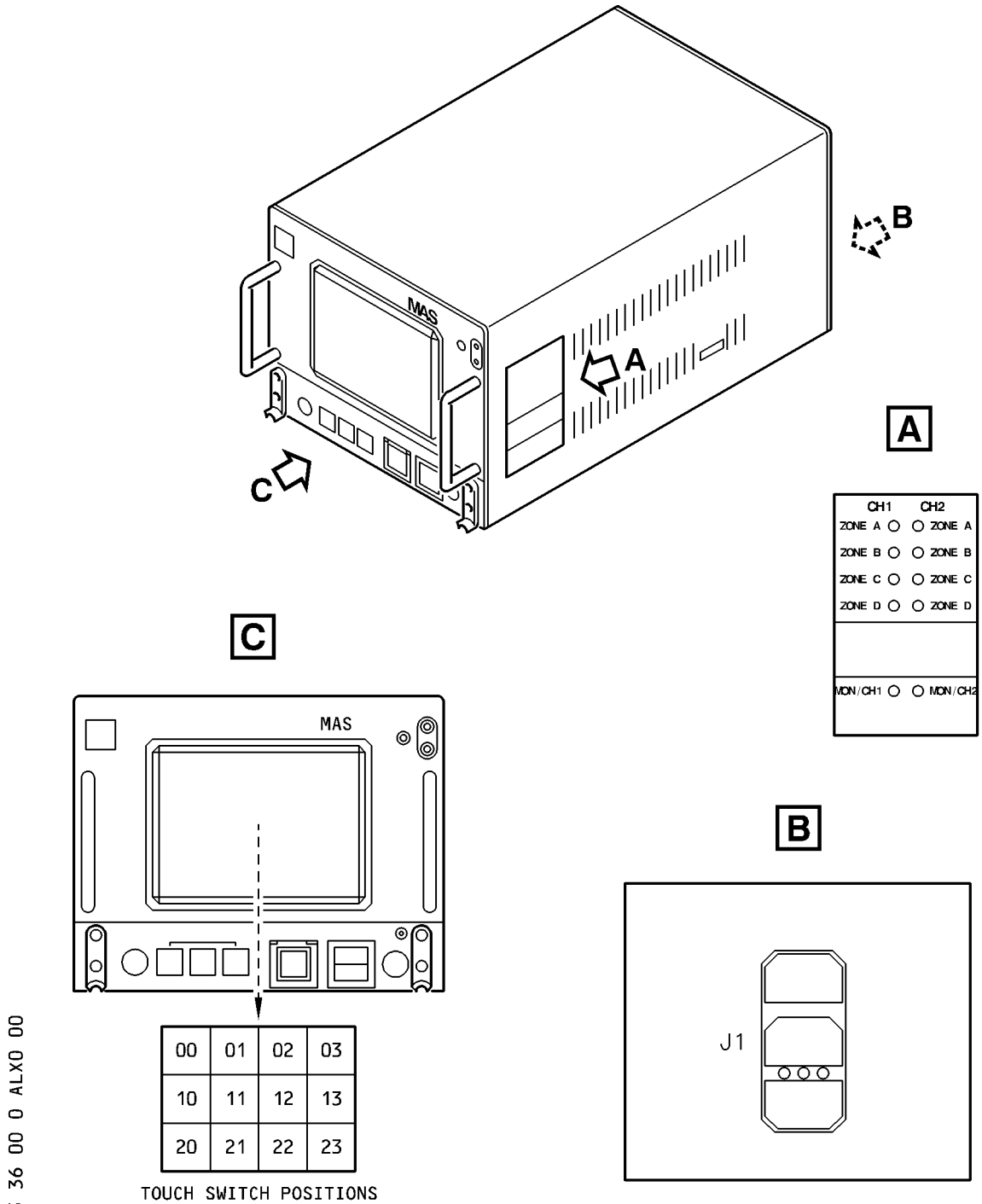
The video distribution units (VDU) distribute electrical power, control data and video signals to the projectors, the LCD monitors and the retractable monitors. A combination of up to two monitors/projectors can be supplied from each VDU.
The SCU communicates with each VDU using serial data transmission lines. These data transmission lines are used to send control commands to the VDU. The data transmission lines are also used to send BITE (built-in test equipment) test result data from the VDU to the SCU.
Each VDU receives three video inputs from the SCU (or the previous VDU in the series). A control processor and a video channel switch in the VDU distributes one of the video signals to the associated monitors/projectors. The video signal sent to the monitors/projectors is dependant on the selection made at the SCU.
The switching on and off of the monitors/projectors is controlled by an electronic switch and the control processor in the VDU. The control processor receives an on/off command from the SCU on the data transmission lines. The control processor operates an electronic switch in the VDU.




BM6 23 36 00 0 ALEO 00

System Control Unit
Figure 012




BM6 23 36 00 0 ALX0 00

System Control Unit
Figure 013

28 V DC is then sent/removed from the monitor/projector to switch on/off the monitor/projector. A power supply circuit in the VDU supplies the 28 V DC and the voltages for the VDU circuits. These voltages are derived from the system 115 V AC electrical supply.
One electrical connector is used to interface the VDU with the each monitor/projector. One electrical connector is used to receive the video signal and control data. One electrical connector is used to send the video signal and the control data to the next VDU in the series. When the VDU is the last VDU in the series, a resistive terminator must be connected to the unused connector.
(Ref. Fig. 014)

**ON A/C 001-100,

5. System Power Supply
The system is supplied by the 28 V DC busbar 102PP via circuit breaker. and 115 V AC busbar 110XP via circuit breaker.
The circuit breakers are located in panel 800VU.
115 V AC and 28 V DC are supplied through the circuit breakers to the monitors.The retraction mechanism.is supplied of the respective monitors.
Power to the other system components is switched through the SCU. In the case of cabin depressurization is the PES-video switched off by the SCU.

**ON A/C 101-200,

5. Power Supply
115 V AC is supplied to the video system, via circuit breakers, from busbar 110XP. 28 V DC is supplied to the zone PA audio relays from the passenger entertainment (music) system.

**ON A/C 001-100,

(Ref. Fig. 015)

R **ON A/C 101-104,

(Ref. Fig. 016)

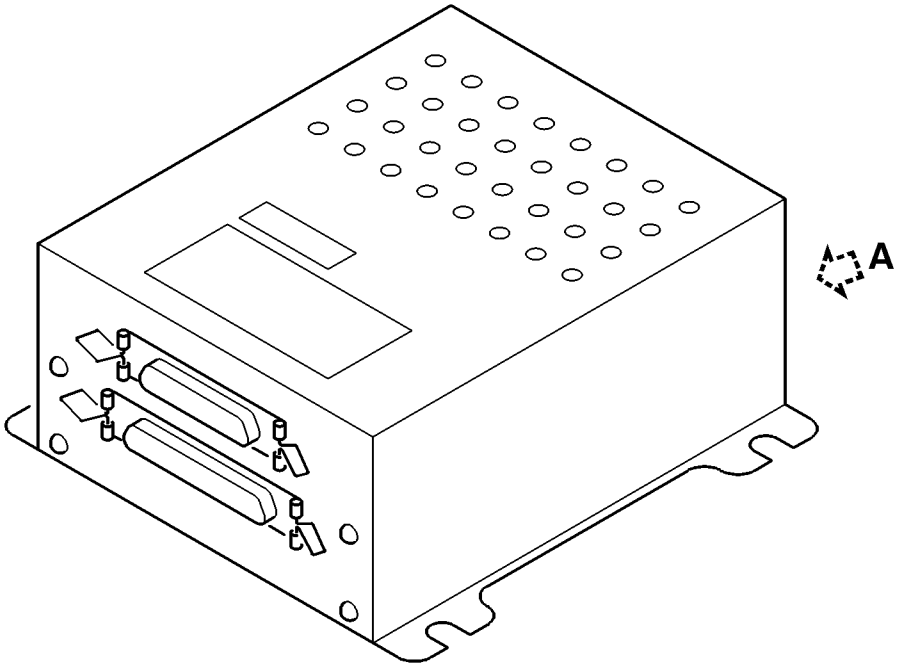
R **ON A/C 105-200,

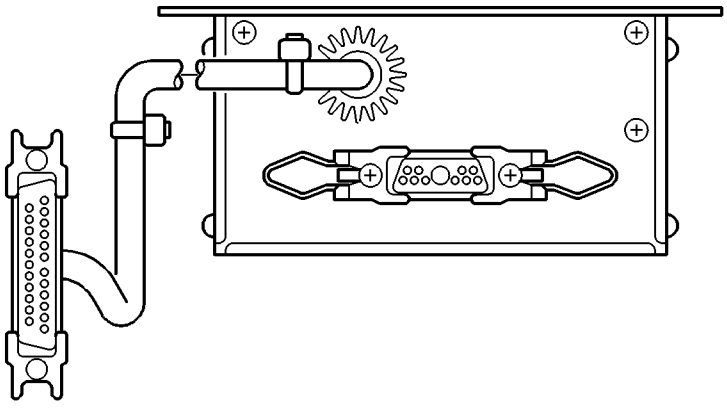
R (Ref. Fig. 017)

**ON A/C 001-100,

6. System Operation

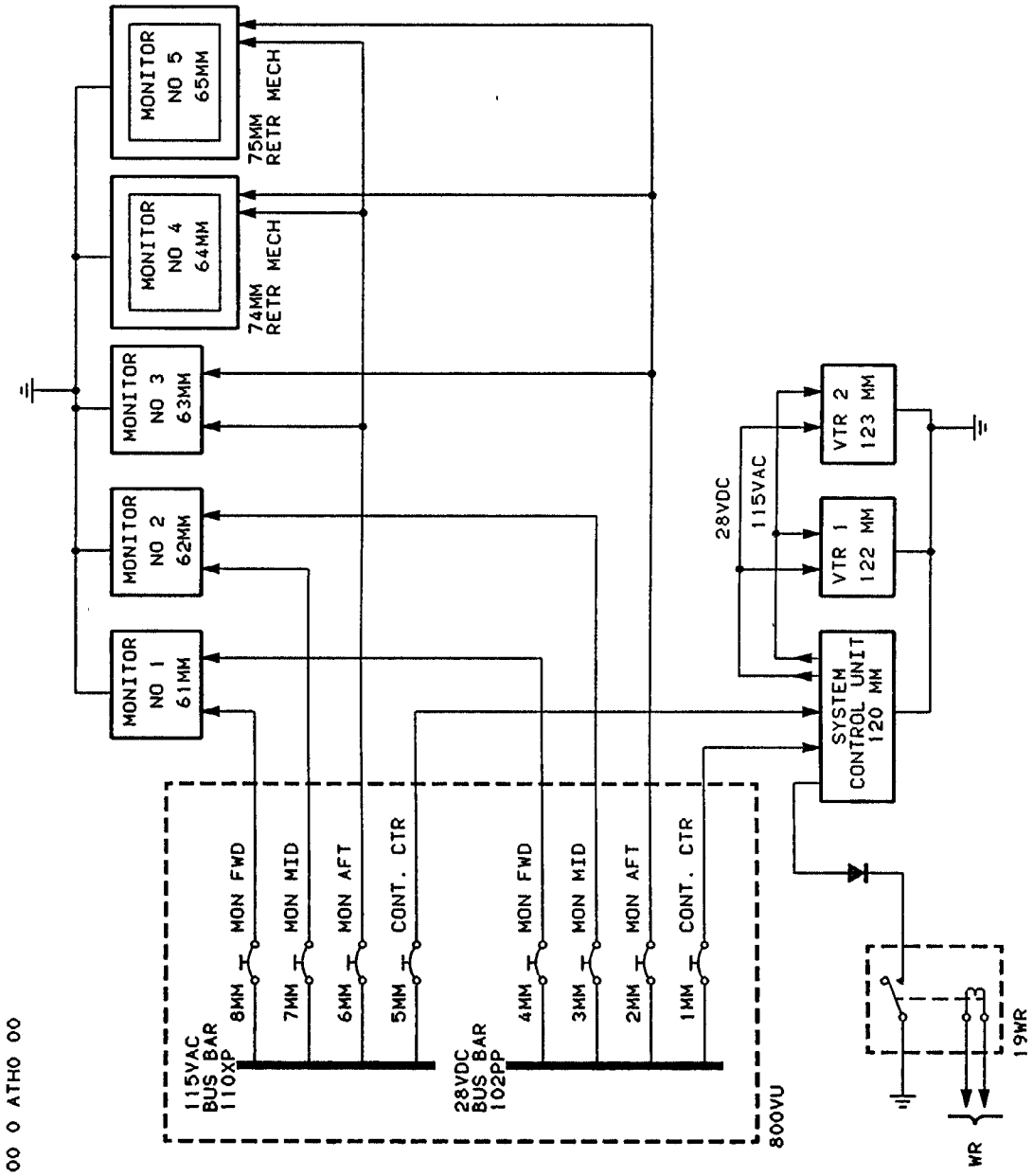
A. Energization



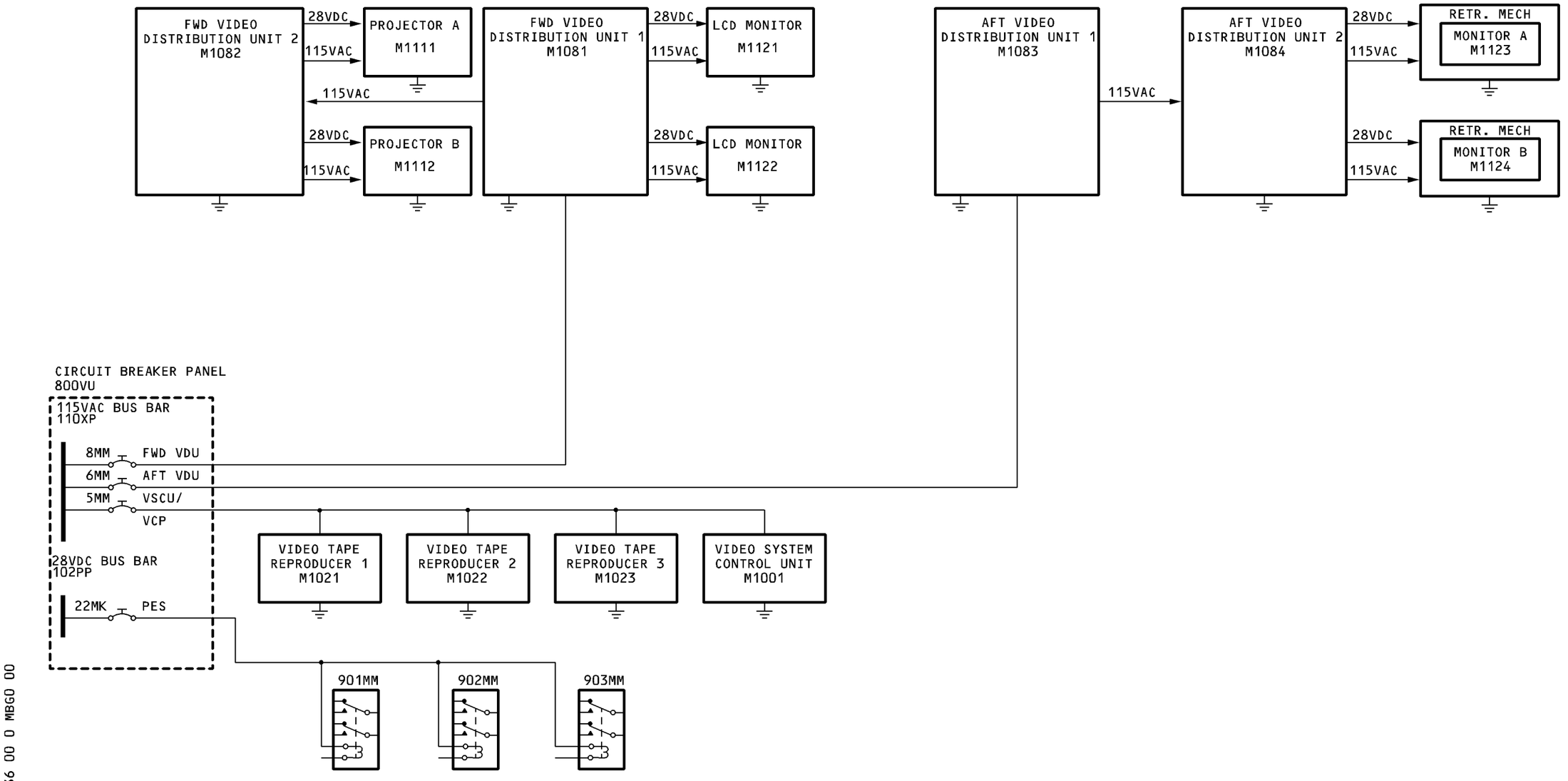

BM6 23 36 00 0 MRD0 00

Video Distribution Unit
Figure 014



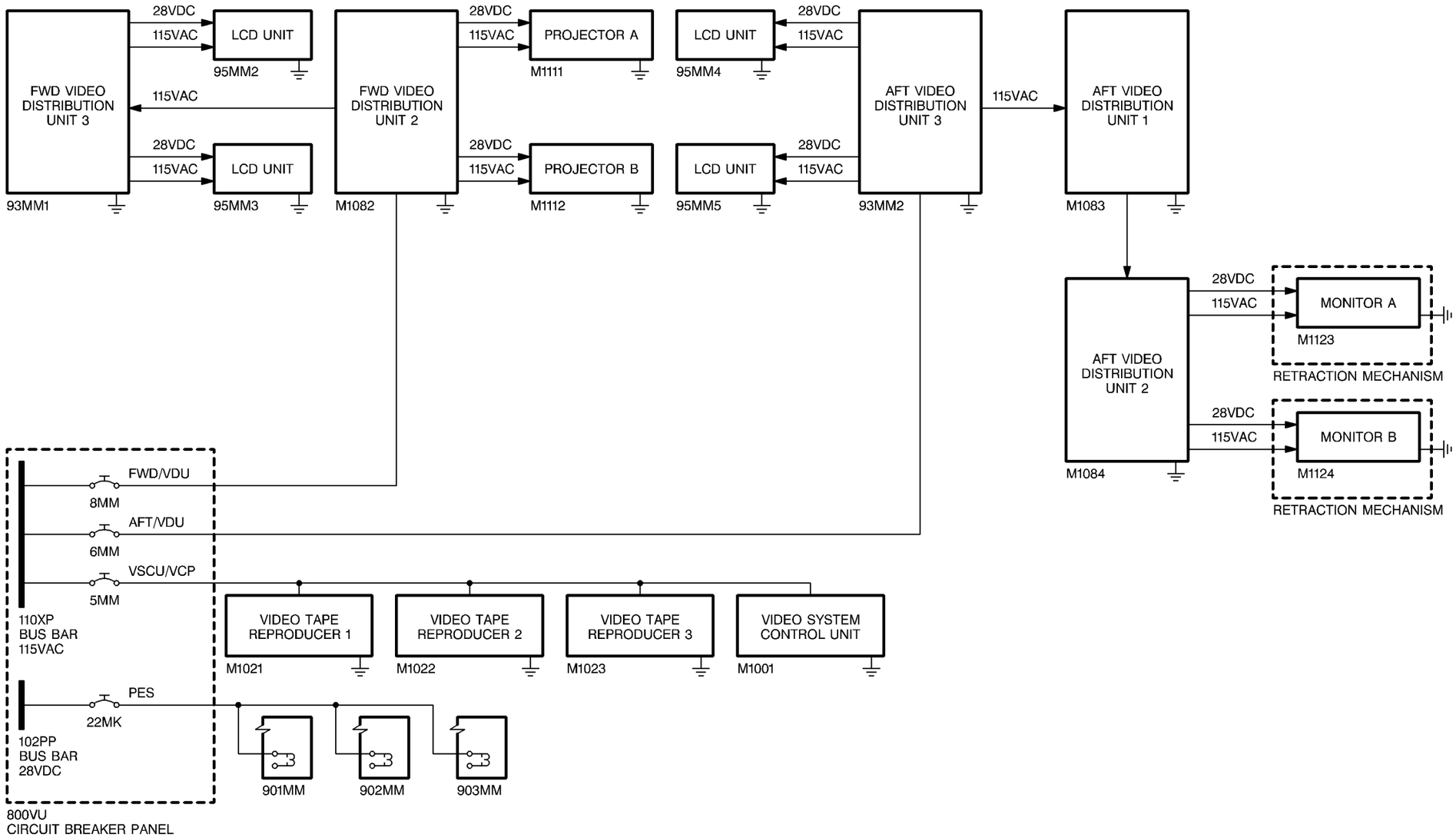

B M 6 23 36 00 0 ATH0 00

System Power Supply
Figure 015




BM6 23 36 00 0 MBG0 00

System Power Supply
Figure 016




BM6 23 36 00 0 MBR0 00

System Power Supply
Figure 017

R

R EFFECTIVITY: 105-200,

PIA



Printed in France

When power is supplied to the busbars and the system circuit breakers are closed, the monitors,the retraction mechanism. with monitors and the SCU are supplied with 115 V AC and 28 V DC.
The VTRs are supplied with 115 V AC and 28 V DC by pressing the SCU SYS POWER switch in ON position. The integral light in the switch of SYS POWER comes on in ON position.

R **ON A/C 101-104,

6. System Operation

A. Energization
With electrical power supplied to the busbars and the system circuit breakers closed, 115 V AC electrical power is supplied directly to:
to:
- the SCU.
- VTR1, VTR2 and VTR3.
- FWD video distribution unit 1 and AFT video distribution unit 2.
115 V AC and 28 V DC electrical power is supplied to the projectors, the LCD monitors and the overhead monitors thru their associated video distribution units.

R **ON A/C 105-200,

R 6. System Operation

R A. Energization
R With electrical power supplied to the busbars and the system circuit
R breakers closed, 115 V AC electrical power is supplied directly to:
R - the SCU.
R - VTR1, VTR2 and VTR3.
R - FWD video distribution unit 2 and AFT video distribution unit 3.
R 115 V AC and 28 V DC electrical power is supplied to the projectors, the
R LCD monitors and the overhead monitors thru their associated video
R distribution units.

**ON A/C 001-100,

(Ref. Fig. 018)

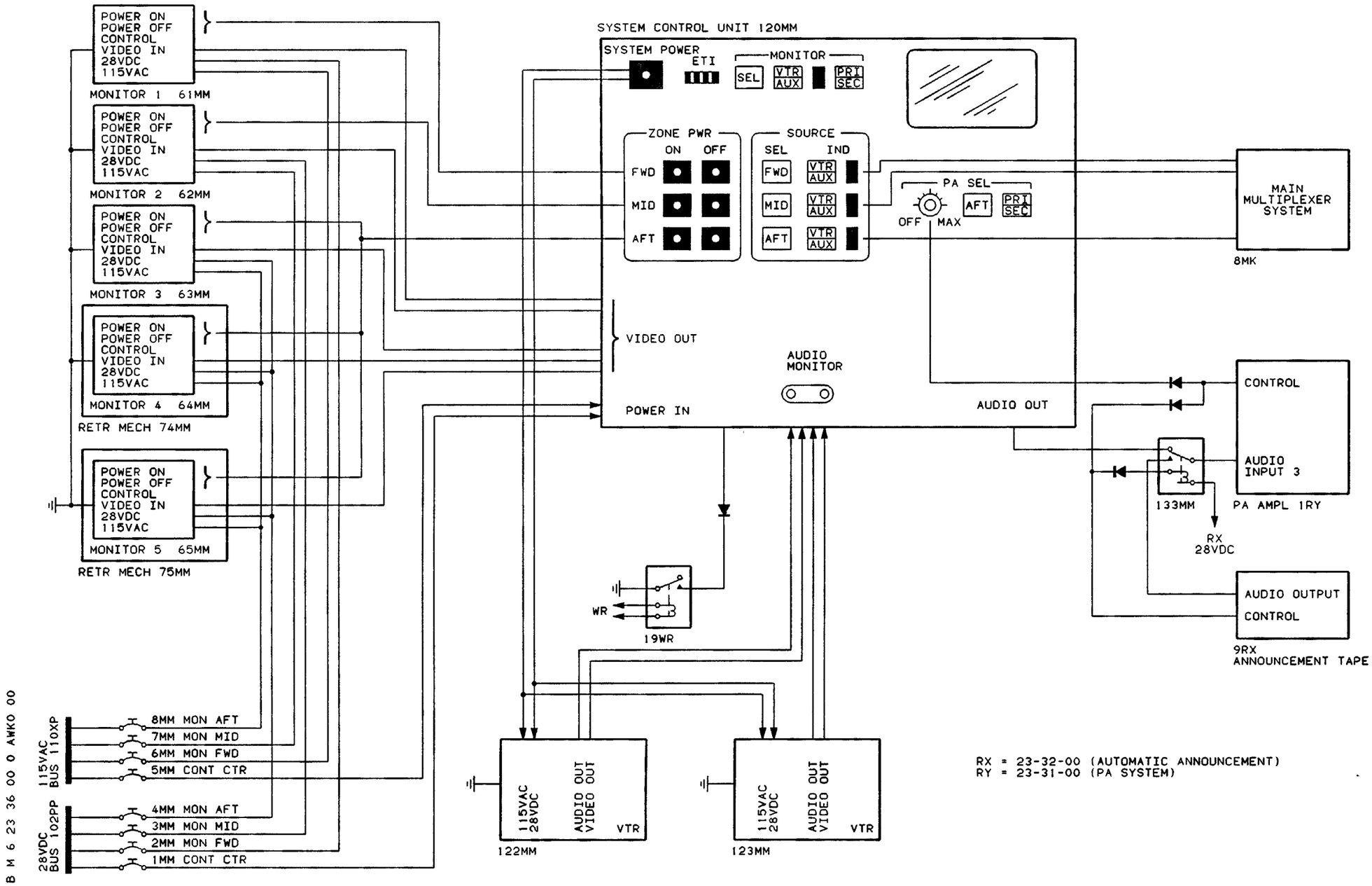
R **ON A/C 101-104,

(Ref. Fig. 019)

R **ON A/C 105-200,

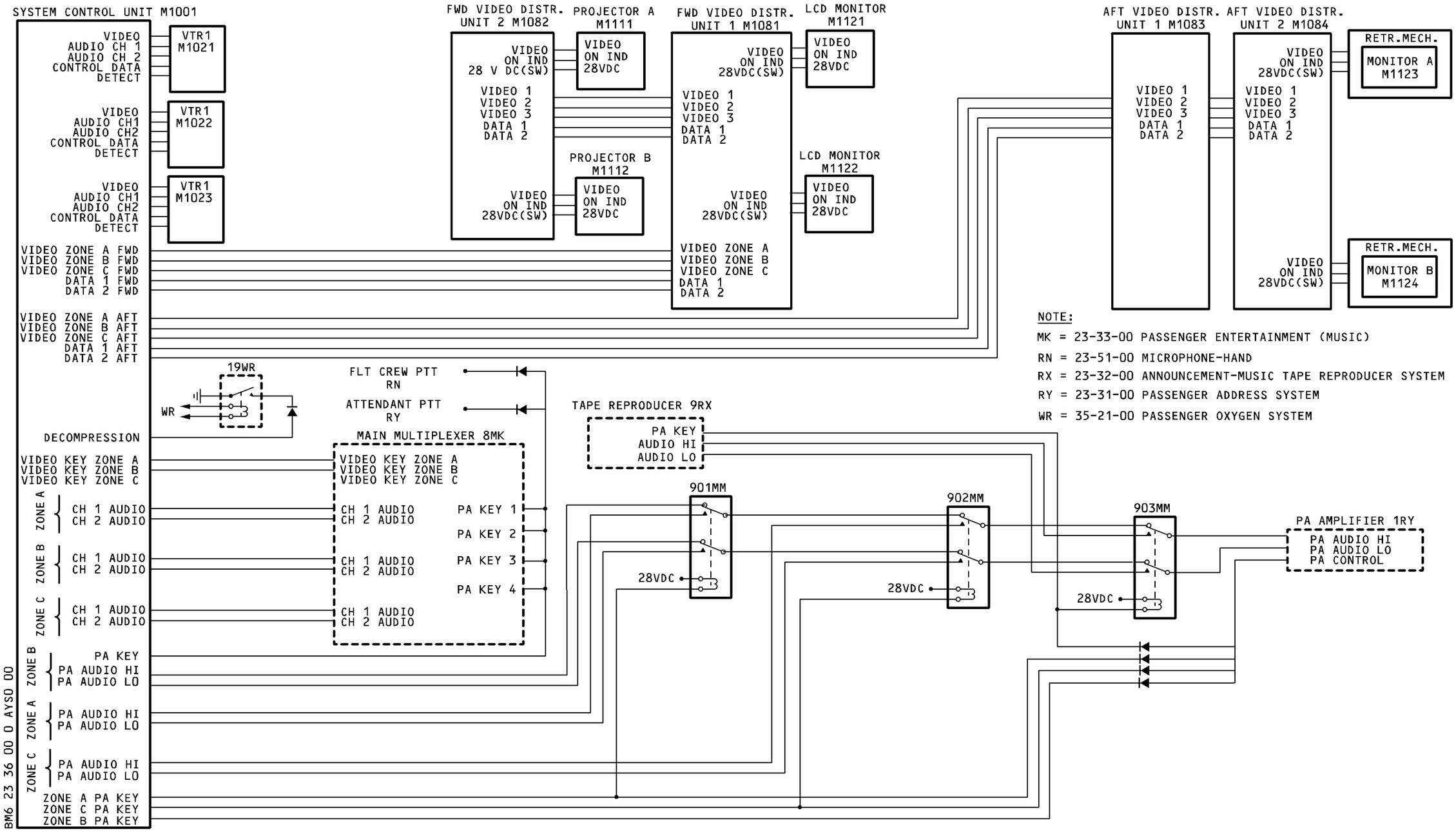
R (Ref. Fig. 020)

INTENTIONALLY BLANK

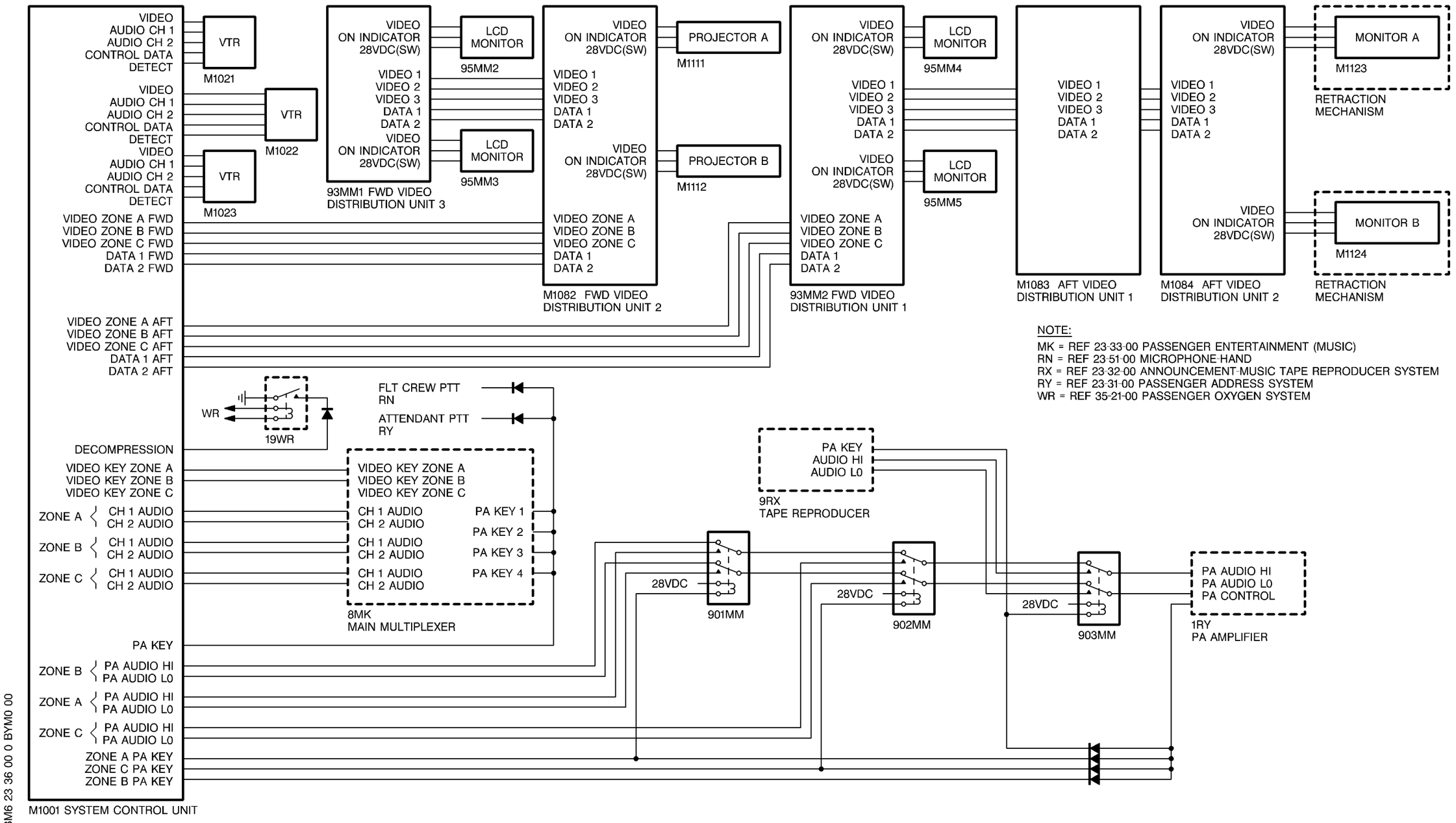



RX = 23-32-00 (AUTOMATIC ANNOUNCEMENT)
RY = 23-31-00 (PA SYSTEM)

Video System - Block Schematic
Figure 018




Passenger Entertainment (Video)
Schematic - Video and Audio Video Distribution
Figure 019




NOTE:

MK = REF 23-33-00 PASSENGER ENTERTAINMENT (MUSIC)
RN = REF 23-51-00 MICROPHONE-HAND
RX = REF 23-32-00 ANNOUNCEMENT-MUSIC TAPE REPRODUCER SYSTEM
RY = REF 23-31-00 PASSENGER ADDRESS SYSTEM
WR = REF 35-21-00 PASSENGER OXYGEN SYSTEM

BM6 23 36 00 0 BYM0 00

Passenger Entertainment (Video)
Schematic - Video and Audio Video Distribution
Figure 020

R

**ON A/C 001-100,

B. VTR
(1)Loading/Unloading
The VTR is loaded by inserting the cassette cartridge into the cartridge access door with the arrow on the cartridge pointing towards the VTR. The VTR is unloaded by pressing the STOP pushbutton, then pressing the EJECT pushbutton and removing the cassette from the access door. Loading and unloading can only be done when the VTR is powered.
(2)Operation
Playback of the cassette is initiated by pressing the PLAY pushbutton. The program signals, stored on the magnetic tape are picked-up by the VTR heads, conditioned and fed to the SCU for transmission to the selected zone.
The FF and REW pushbuttons enable the cassette tape to move quickly in the fast forward or reverse directions. Movement of the tape in either direction is halted when the STOP pushbutton is pressed.
The STANDBY/ON and integral lights in the control switches indicate the functional status of the VTR. The 'TV SYSTEM' select switch must be set to the color format of the cassettes being used (CCIR/PAL/NTSC).
When the cassette used is prerecorded in NTSC format and the 'TV SYSTEM' select switch is set to 'NTSC', the correct mode, e.g. NTSC 3.58, will be selected automatically.

**ON A/C 101-200,

B. Video Tape Reproducer (VTR)
(1)Loading
Loading a tape cassette into the VTR is possible when electrical power applied to the system and the system circuit breakers are closed. The VTR is loaded by inserting the tape cassette into the cartridge access door with the arrow on the tape cassette pointing towards the VTR. The tape cassette is then automatically drawn into the VTR, If, previous to inserting the tape cassette the VTR was turned off, inserting the tape cassette turns the VTR on. When a cassette is loaded into the VTR the integral light in the POWER P/BSW comes on.
(2)Unloading
Unloading a tape cassette from the VTR is only possible when electrical power has been applied to the system and the system circuit breakers are. closed. The tape cassette is unloaded from the VTR by pressing the EJECT P/BSW and removing the tape cassette from the cartridge access door.
(3)Operation
Playback of the tape cassette video program is initiated by pressing either the VTR PLAY P/BSW or remotely from the SCU. the program signals stored on the magnetic tape are picked up by the VTR heads. The signals are conditioned and sent to the SCU for transmission to the selected zones. The FF and REW P/BSWs enable the cassette tape to be moved quickly

in a forward or reverse direction. Movement of the tape in either direction is halted when the STOP P/BSW is pressed. When on, the STBY indicator light indicates the presence of moisture in the VTR. The VTR will not operate while the STBY indicator light is on.

**ON A/C 001-100,

C. SCU

(1)Source Selection

The video programs from tape reproducers are selected for any zone by pressing the relevant zone selector switches on the SCU. The selected VTR will be indicated on displays.

(2)Video Picture Display

When the ZONE PWR/ON switch is depressed, the integral light comes on and the video output from the selected source is transmitted via the SCU to the zone monitors. The program pictures are then displayed on the monitor screen. The monitors in each zone are switched off together by depressing the respective ZONE PWR/OFF pushbutton switch or individually by retracting the respective monitor module into the stowed position.

(3)Sound Distribution

The program sound from the VTR is amplified in the SCU and distributed via the passenger entertainment system to the passenger control units (PCUs) in the seats. The program is then heard through electric or pneumatic headsets connected to the PCUs over relevant channels. Video sound can also be distributed over the passenger address (PA) system loudspeakers by using the PA on/off and volume control switch. When the switch is moved away from the OFF position, the PA amplifier key line is grounded and the program sound is heard over both the PA system speakers. There is no zone separation when the PA system is selected for video sound distribution. When the switch is used , the audio output from the VTR via SCU and relay 133MM is broadcast over the PA loudspeakers.

Volume control of the PA speakers is adjusted by rotating the PA switch on the SCU in the required direction.

The pushbutton selector switch enables selection of the tape sound track primary or secondary language (PRI/SEC) required for distribution. Integral lights indicate the track selected.

(4)Priority Announcements

Announcements broadcast over the PA system by the flight crew, the attendants or from the prerecorded announcements tape reproducer have priority over the video entertainment system and will override the video program sound. When an announcement is made, a key line from the announce buffer in the SCU is grounded. This enables the PA amplifier output, which is directed through the buffer, to override the video input to the SCU audio amplifiers. When a prerecorded announcement is made, the relay 133MM is energized to direct the reproducer output to the PA amplifier where it is fed to the SCU audio amplifiers. The outputs of the audio amplifiers are distributed via the multiplexer of the passenger entertainment system to the relevant video channels in the PCUs. In this way announcements are heard by passengers using the entertainment

headsets.

(5)Program Monitoring

The **MONITOR** source selector switch enables the pictures and sound from the video sources to be monitored.

The program sound from either of the two sound tracks from the **VTR** is monitored by using the **SEL** switch to select the respective track and listening to the sound through a headset plugged into the socket on the front panel of the **SCU**.

The pictures from the selected source can be viewed and checked in black and white on the display screen.

**ON A/C 101-200,

C. System Control Unit (SCU)

(1)Zone and Source Configuration

Assigning the monitors/projectors to the seperate video zones is done from the **SCU**. When the **SCU** is switched off, pressing the **EXEC, MENU** and **SYST PWR P/BSW**s simultaneously causes the system parameter menu to be shown on the **LCD** screen. From this screen the **VDU**s are programmed and the monitors/projectors are designated their video zones. The number of **VTR**s being utilized is also set from the system parameter menu. After the system parameters have been set, and the **SYST PWR** switch on the **SCU** has been pushed in the off position, the previously set parameters are then loaded into the non-volatile memory of the **SCU**.

(2)Zone and Source Selection

Pressing the **SYST PWR** switch on the front face of the **SCU** turns the **SCU** on. **A** guidance text for menu selection is initially shown on the **LCD** touch screen. This touch screen has 12 touch switches in a matrix of four columns and three rows. Touching the **CONT** symbol on the **LCD** touch screen causes the **MENU** page to be shown on the **LCD** touch screen.

**O**n the top line of the **MENU** page is shown the video zones for the passenger compartment. The passenger compartment is divided into zones **A, B** and **C**. The **ZONE A** touch switch controls projector **A** in the forward passenger compartment. The **ZONE B** touch switch controls projector **B** and the two **LCD** monitors in the mid passenger compartment. The **ZONE C** touch switch controls the retractable monitors in the aft passenger compartment.

**O**n the second line of the **MENU** page the video sources for the monitors are shown. Three sources are shown on this line, **VTR1, VTR2** and **VTR3**. Touching the required source touch switch selects the video source for the previously selected zone. Any required zone-source combination can be selected from the **MENU** page. After touching the video source touch switch, the video source **CONTROL** page is shown on the **LCD** screen. Remote control of the selected **VTR** is done from the **CONTROL** page. **N**ormal **REW, PLAY, FF** and **STOP VTR** controls are pictorially displayed on this screen. Touching the **PLAY** and then the **PREV P/BSW** causes the video program from the selected **VTR** to be displayed on the **SCU LCD** monitor screen. This facility is used to monitor the video program prior to distribution to the passenger compartment. The audio video program is monitored thru an electrical headset connected to the one of the **MONITOR** headset jacks on the **SCU**.

(3)Video program distribution
Pressing the EXEC P/BSW on the SCU front panel after zone and source selection causes:
- the projectors to start running and the LCD monitor screens to come on (if selected).
- all retractable monitors to extend to the viewing position and their screens to come on (if selected).

The selected video program is then distributed to the selected zones thru the SCU and the video display units

(4)Audio video program distribution
The SCU receives the audio video program from the selected VTR. The audio video program is distributed thru the SCU to the passenger entertainment (music) system. The audio video program is selected by selecting the appropriate channel on the passenger control unit (PCU). The audio video program can also be broadcast thru the PA system. On the third line of the MENU page a PA touch switch is shown. Touching the PA touch switch causes the keyline to the PA amplifier to be grounded. The selected audio video program is sent from the SCU thru the zone PA relays the PA amplifier. The PA VOLUME MIN/MAX control on the front face of the SCU controls the volume of the audio video program being broadcast over the PA system. The CH1/CH2 toggle switch, on the front face of the SCU, selects the VTR audio channel to be broadcast over the PA system.

(5)Announcement Priorities
Announcements broadcast over the PA system by the flight crew, the cabin attendants or from a prerecorded announcement source override the audio video program. When a a prerecorded announcement is initiated, a keying ground is sent to the PA amplifier and to relay 903MM which is then energized. The audio from the tape reproducer is sent thru the energized contacts of relay 903MM to the PA amplifier. All PA announcements are also distributed thru the main multiplexer on all PCU channels.

**ON A/C 001-100,

D. Depressurization
In the event of a loss of cabin pressure at high altitude, contacts in the passenger oxygen system relay 19WR close to feed a ground to the SCU. This causes the video entertainment system to switch off and all retractable monitors to return into the stowed position.

**ON A/C 101-200,

D. Depressurization
In the event of a sudden loss of cabin pressure at high altitude, passenger oxygen system relay 19WR energizes. Through the closed contacts of the relay a ground is sent to the SCU. This ground causes the video system to shut off. The projectors stop running, all the monitor screens go off and all retractable monitors move to the stowed position.

1. Operational Test

R **ON A/C 001-100,

A. Reason for the Job
(1)Operational test of passenger entertainment video system

R **ON A/C 101-200,

R A. Reason for the Job
R (1)Operational test of passenger entertainment video system

R **ON A/C 001-100,

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| (2) | Video Test Tape VHS<br>TRANS COM PN: 951-0344-001 |
| (3) | Pneumatic Headset |
| (4) | Electric Headset |

Referenced Procedures

| | |
|---|---|
| - 23-31-00, P. Block 501 | Passenger Address System |
| - 23-32-00, P. Block 501 | Announcement - Music Tape Reproducer System |
| - 23-33-00, P. Block 501 | Passenger Entertainment (Music) |
| - 24-41-00, P. Block 301 | AC External Power Control |

R **ON A/C 101-200,

R B. Equipment and Materials

| R ITEM | DESIGNATION |
|---|---|
| R (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| R (2) | Video Test Tape VHS<br>MATSUSHITA PN: RD-AM9553 |
| R (3) | Pneumatic Headset |
| R (4) | Electric Headset |

R Referenced Procedures

R - 23-31-00, P. Block 501 Passenger Address System
R - 23-32-00, P. Block 501 Announcement - Music Tape Reproducer System
R - 23-33-00, P. Block 501 Passenger Entertainment (Music)
R - 24-41-00, P. Block 301 AC External Power Control

R **ON A/C 001-100,

C. Procedure
(1)Job Set-Up
(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)Energize passenger address system (Ref. 23-31-00, P. Block 501).
(d)Energize announcement - music tape reproducer system (Ref. 23-32-00, P. Block 501).
(e)Energize passenger entertainment (music) system (Ref. 23-33-00, P. Block 501).
(f)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | P.A. OXYGEN CTL/WARN | 1WR | H24 |
| 22VU | P.A. OXYGEN ACTUATION | 2WR | H25 |

(g)Make certain that the following circuit breakers in panel 800VU are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | VIDEO CONT CTR | 1MM | D 6 |
| 800VU | VIDEO CONT CTR | 5MM | D 7 |
| 800VU | VIDEO MONITORS FWD | 8MM | D 8 |
| 800VU | VIDEO MONITORS FWD | 4MM | D 9 |
| 800VU | VIDEO MONITORS MID | 3MM | D10 |
| 800VU | VIDEO MONITORS MID | 7MM | D11 |
| 800VU | VIDEO MONITORS AFT | 6MM | D12 |
| 800VU | VIDEO MONITORS AFT | 2MM | D13 |

R **ON A/C 101-200,

R C. Procedure
R (1)Job Set-Up
R (a)Connect electrical ground power unit and energize aircraft electrical
R network (Ref. 24-41-00, P. Block 301).
R (b)Make certain that electronics racks ventilation is correct.
R (c)Energize passenger address system (Ref. 23-31-00, P. Block 501).
R (d)Energize announcement - music tape reproducer system (Ref. 23-32-00,
R P. Block 501).
R (e)Energize passenger entertainment (music) system (Ref. 23-33-00,

R P. Block 501).
R (f)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | P.A. OXYGEN CTL/WARN | 1WR | H24 |
| 22VU | P.A. OXYGEN ACTUATION | 2WR | H25 |

R (g)Make certain that the following circuit breakers in panel 800VU are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | FWD VDU | 8MM | |
| 800VU | AFT VDU | 6MM | 7 |
| 800VU | VSCU/VCP | 5MM | |

R (h)Remove projector lens protective covers, if fitted.
R (j)Place video viewing screens in viewing position.
R (k)Open service doors on base of projector containers to gain access to projector control knobs.

R CAUTION : THE TAPE REPRODUCER IS FITTED WITH A MOISTURE SENSING CIRCUIT, WHICH WILL SWITCH OFF THE VTR IF MOISTURE IS DETECTED. THE 'STBY' INDICATOR WILL COME ON WHEN MOISTURE IS DETECTED. A HEATER IN THE VTR WILL BE ACTIVATED TO ELIMINATE THE MOISTURE. WHEN THE MOISTURE IS REMOVED THE 'STBY' INDICATOR WILL GO OFF, ALLOWING THE VTR TO RESUME OPERATION.
DO NOT INSERT THE VIDEO CASSETTE IF THE MOISTURE SENSING CIRCUIT IS ACTIVATED.

R **ON A/C 001-100,

(2)Test

| ACTION | RESULT |
|---|---|
| 1. On System Control Unit (SCU):<br>- press P/B 'SYSTEM POWER' in on position. | On SCU:<br>- integral light in P/B 'SYSTEM POWER' comes on.<br>- all indicator light in P/B ZONE PWR 'OFF' comes on.<br>- all indicater light 'VTR' comes on and digit VTR '0' is displayed. |
| 2. On Video Tape Reproducer 1 (VTR1) and Video Tape Reproducer 2 (VTR2):<br>- insert test cassettes arrow on top side of cassettes must point in direction of VTR.<br>- after 5 seconds, press P/B 'REW'. | On VTR1 and VTR2:<br>- the tapes are rewound and stopped automatically when beginning is reached. |

| ACTION | RESULT |
|---|---|
| - press P/B 'FF'. | - integral light in P/B 'FF' comes on.<br>- video tapes are wound forward rapidly in approx. 4 min. |
| - press P/B 'REW'. | - integral light in P/B 'FF' goes off.<br>- integral light in P/B 'REW' comes on.<br>- video tapes are rewound rapidly in approx. 4 min. |
| - press P/B 'PLAY'. | - integral light in P/B 'PLAY'comes on |
| 3. On SCU:<br>- press P/B MONITOR 'SEL' to select VTR1 'PRI'. | On SCU:<br>- indicator light MONITOR 'PRI' comes on and digit '1' is displayed in MONITOR section.<br>- control monitor comes on.<br>- within 1 min., a clear and undistorted video picture in black/white appears on the control monitor. |
| NOTE : Program picture must be displayed for a minimum of 5 min. to verify picture stability. | |
| 4. On VTR1:<br>- rotate the TRACKING control knob to right and left of detent position.<br>- place knob in position for optimal picture. | On VTR1:<br>- ensure that picture stability and clarity changes with the position of the knob.<br>- optimal picture is displayed. |
| 5. On SCU:<br>- connect headset into AUDIO MONITOR electric jack. | On SCU:<br>- over headset program sound is heard clearly and undistorted without interference. |
| - press P/B MONITOR 'SEL' to select VTR1 'SEC'. | - indicator light MONITOR 'PRI' goes off.<br>- indicator light MONITOR 'SEC' comes on.<br>- over headset program sound is heard clearly and undistorted without interference. |
| - press P/B MONITOR 'SEL' to select VTR2 'PRI'. | - indicator light MONITOR 'SEC' goes off.<br>- indicator light MONITOR 'PRI' comes on and digit '2' is displayed in MONITOR section.<br>- within 1 min., a clear and undistorted video picture in black/white appears on the control monitor.<br>- over headset program sound is heard clearly and undistorted without |

| ACTION | RESULT |
|---|---|
| | interference. |
| NOTE : Program picture must be displayed for a minimum of 5 min. to verify picture stability. | |
| 6. On VTR2:<br>- rotate the TRACKING control knob to right and left of detent position.<br>- place knob in position for optimal picture. | On VTR2:<br>- ensure that picture stability and clarity changes with the position of the knob.<br>- optimal picture is displayed. |
| 7. On SCU:<br>- press P/B MONITOR 'SEL' to select VTR2 'SEC'. | On SCU:<br>- indicator light MONITOR 'PRI' goes off.<br>- indicator light MONITOR 'SEC' comes on.<br>- over headset program sound is heard clearly and undistorted without interference. |
| - press P/B MONITOR 'SEL' to select VTR3 'PRI'. | - indicator light MONITOR 'SEC' goes off.<br>- indicator light MONITOR 'PRI' comes on.<br>- if VTR3 not installed, no program sound is heard over headset.<br>- no picture appears on the control monitor. |
| - press P/B MONITOR 'SEL' to select VTR3 'SEC'. | - indicator light MONITOR 'PRI' goes off.<br>- indicator light MONITOR 'SEC' comes on.<br>- if VTR3 not installed, no program sound is heard over headset.<br>- no picture appears on the control monitor. |
| - press P/B MONITOR 'SEL' to select VTR0. | - indicator light MONITOR 'PRI/SEC' goes off and digit '0' is displayed.<br>- no program sound is heard over headset.<br>- control monitor goes off. |
| 8. On Passenger Control Unit (PCU) in one of the available viewing zones:<br>- connect headset to any PCU in FWD zone and select channel 1 or 2 successively and rotate volume control knob thru complete range. | On corresponding PCU:<br>- no audio video program is heard on either channel. |
| 9. Repeat step 8. for MID and AFT zone. | - same Result as step 8. |
| 10. On SCU:<br>- press P/B SOURCE SEL 'FWD' to select VTR1. | On SCU:<br>- SOURCE IND digit VTR '1' for FWD is displayed. |

| ACTION | RESULT |
|---|---|
| - press P/B ZONES PWR FWD 'ON'. | - integral light in P/B ZONE PWR 'ON' comes on.<br>- integral light in P/B ZONE PWR 'OFF' goes off.<br>In passenger compartment:<br>- within 1 min., same program as on control monitor appears on cabin monitor, No. 1 but in color. |
| 11. On SCU:<br>- press P/B SOURCE SEL 'MID' to select 'VTR1'.<br>- press P/B ZONES PWR MID 'ON'. | On SCU:<br>- SOURCE IND digit VTR '1' for MID is displayed.<br>- integral light in P/B ZONE PWR 'ON' comes on.<br>- integral light in P/B ZONE PWR 'OFF' goes off.<br>In passenger compartment:<br>- within 1 min., same program as on control monitor appears on cabin monitor, No. 2 but in color. |
| 12. On SCU:<br>- press P/B SOURCE SEL 'AFT' to select 'VTR1'.<br>- press P/B ZONES PWR AFT 'ON'. | On SCU:<br>- SOURCE IND digit VTR '1' for AFT is displayed.<br>- integral light in P/B ZONE PWR 'ON' comes on.<br>- integral light in P/B ZONE PWR 'OFF' goes off.<br>In passenger compartment:<br>- within 1 min., same program as on control monitor appears on cabin monitor No. 3, No.4 and No. 5 but in color.<br>- monitor No. 4 and No. 5 moves into the viewing position. |
| 13. Repeat step 10. thru 12. with VTR2. | - same Result as step 10. thru 12. instead VTR1 with VTR2. |
| 14. On PCU:<br>- connect headset to ech PCU in FWD zone and select video channels 1 or 2 successively.<br>- rotate volume control knob thru complete range. | On corresponding PCU:<br>- over headset program sound is heard clear and undistorted on either channels.<br>- audio volume varies smoothly thru complete range. |
| 15. Repeat step 14. for MID and AFT zone. | - same result as step 14. |
| 16. On SCU:<br>- rotate rotary switch PA SEL clockwise away from 'OFF' position.<br>- press P/B PA SEL 'AFT' to select SEC. | On SCU:<br>- indicator PA SEL 'PRI' comes on.<br>- indicator light 'PRI' goes off.<br>- indicater light 'SEC' comes on.<br>In passenger compartment: |

| ACTION | RESULT |
|---|---|
| | - accompanying program sound from track 2 is heard over all passenger compartment loudspeakers as well as over headset connected to the PCU. |
| - rotate rotary switch PA SEL clockwise smoothly to 'MAX' position. | - sound varies smoothly thru complete volume range. |
| | On SCU: |
| - press P/B PA SEL 'AFT' to select PRI. | - indicator light 'SEC' goes off. |
| | - indicater light 'PRI' comes on. |
| | In passenger compartment: |
| | - accompanying program sound from track 1 is heard over all passenger compartment loudspeakers as well as over headset connected to the PCU. |
| - rotate rotary switch PA SEL clockwise smoothly to 'MAX' position. | - sound varies smoothly thru complete volume range. |
| 17. At attendent purser station: | In passenger compartment: |
| - select PA and make announcement over the PA system during video program is running. | - PA announcement is heard over loud-speaker and over video channel 1 or 2 of PCUs. |
| | - audio program is overridden for the duration of PA announcement. |
| - stop the PA announcement | - PA announcement goes off. |
| | - audio program is audible. |
| 18. At purser station, on announcement control unit: | In passenger compartment: |
| - select announcement program. | - announcement is heard over loud-speaker and over video channel 1 or 2 of PCUs. |
| | - audio program is overridden for the duration of announcement. |
| - stop the announcement | - announcement goes off. |
| | - audio program is audible. |
| 19. On SCU: | In passenger compartment: |
| - rotate rotary switch PA SEL counterclockwise in 'OFF' position. | - video program sound over loud-speacker goes off. |
| 20. On reley 19WR in panal 282VU: | On SCU: |
| - bridge contacts A and 2 during video program is running. | - all indicator light on SCU goes off. |
| | On VTR: |
| | - indicator light in P/B 'PLAY' goes off. |
| | In passenger compartment: |
| | - audio and video program goes off. |
| | - monitor No. 4 and No. 5 moves into stowed position. |

| ACTION | RESULT |
|---|---|
| - remove bridge between contacts A and 2. | |
| 21. On SCU:<br>- press P/B 'SYSTEM POWER' in on position. | On SCU:<br>- integral light in P/B 'SYSTEM POWER' comes on.<br>- all indicater light 'VTR' comes on and digit VTR '0' is displayed.<br>- integral light in P/B ZONE PWR FWD, MID and AFT 'OFF' comes on. |
| 22. On VTR1 and VTR2:<br>- press P/B 'PLAY'. | On VTR1 and VTR2:<br>- integral light in P/B 'PLAY' comes on |
| 23. Repeat step No. 10. with VTR1 and step No 11. thru NO. 12. with VTR2. | - same result as step No. 10. thru No. 12. instead VTR1 with VTR2. |
| 24. Repeat step No. 14. for FWD MID and AFT zone. | - same result as step No. 14. |
| 25. On VTR1 and VTR2:<br>- press P/B 'STOP'.<br>- press P/B 'REW'.<br>- press P/B 'EJECT'.<br>- remove cassette out of the cassette access door. | On VTR1 and VTR2:<br>- the cassette tape stoped.<br>- audio and video program goes off.<br>- integral light of 'REW' comes on.<br>- video tape is rewound and stopped automaically.<br>- the cassette drives smoothly out of the cassettes access door.<br>- the cassette cartridge is closed. |
| 26. On SCU:<br>- press P/B 'SYSTEM POWER' in off position. | On SCU:<br>- integral light in 'SYSTEM POWER' goes off.<br>- monitor No 4. and No. 5. moves into stowed position. |

R **ON A/C 101-200,

R (2)Test
R NOTE : Make sure that rotary switch 'PA VOLUME' is set to MIN position.

| ACTION | RESULT |
|---|---|
| 1. On System Control Unit (SCU):<br>- press 'SYST PWR' P/BSW in on position.<br>- press 'MENU P/BSW in on position. | On SCU:<br>- integral light in 'SYST PWR' P/BSW comes on.<br>- integral light in 'MENU' P/BSW comes on.<br>- ZONE A, ZONE B, ZONE C, 1 VIDEO, 2 VIDEO, 3 VIDEO and PA touch switches are shown on the LCD touch panel. |

| ACTION | RESULT |
|---|---|
| | - ZONE A, ZONE B and ZONE C touch switches are shown flashing. |
| - rotate 'BRIGHT'control and adjust for an optimal picture. | - brightness of picture changes with with position of 'BRIGHT' control. |
| 2. On Video Tape Reproducer 1 (VTR 1) VTR 2 and VTR 3: | On VTR 1, VTR 2 and VTR 3: |
| - insert test cassette with arrow on the test cassette pointing in the direction of VTR. | - POWER light comes on.<br>- cassette tape rewinds and stops<br>- automatically at beginning of tape. |
| 3. On SCU: | On SCU: |
| - press ZONE A and 1 VIDEO touch switch. | - integral light in 'MENU' P/BSW goes off.<br>- ZONE A symbol stops flashing. |
| - press ZONE B and 2 VIDEO touch switch. | - ZONE B symbol stops flashing. |
| - press ZONE C and 3 VIDEO touch switch. | - ZONE C symbol stops flashing. |
| - press 'PREV' P/BSW. | - integral light in 'PREV' P/BSW comes on.<br>- 1 VIDEO, 2 VIDEO and 3 VIDEO touch switches are shown on the LCD touch screen. |
| - press 1 VIDEO touch switch. | - REW, PLAY, FF and STOP symbols are shown on the LCD touch screen. |
| - press PLAY touch switch. | - VTR 1 video program is shown on LCD screen.<br>- VTR 1 audio video program is audible over headset. |
| - connect an electrical headset to the MONITOR headset jack. | |
| - press PREV touch switch. | - 1 VIDEO, 2 VIDEO and 3 VIDEO touch switches are shown on LCD touch screen. |
| - press 2 VIDEO touch switch. | - REW, PLAY, FF and STOP symbols are shown on LCD touch screen. |
| - press PLAY touch switch. | - VTR 2 video program is shown on LCD screen.<br>- VTR 2 audio video program is audible over headset. |
| - press PREV touch switch. | - 1 VIDEO, 2 VIDEO and 3 VIDEO touch switches are shown on LCD touch screen. |
| - press 3 VIDEO touch switch. | - REW, PLAY, FF and STOP symbols are shown on LCD touch screen. |
| - press PLAY touch switch. | - VTR 3 video program is shown on LCD screen.<br>- VTR 3 audio video program is audible over headset. |
| - press'EXEC' P/BSW. | - integral light in 'PREV' P/BSW goes off.<br>- integral light in 'EXEC' P/BSW |

| ACTION | RESULT |
|---|---|
| | comes on.<br>In fwd passenger compartment:<br>- VTR 1 video program is shown on the flip screen.<br>In mid passenger compartment:<br>- VTR 2 video program is shown on all monitors and the flipscreen.<br>In aft passenger compartment:<br>- all retractable monitors move to the viewing position.<br>- VTR 3 video program is shown on all monitors. |
| 4. On passenger control units (PCU) in fwd passenger compartment connect<br>- headset.<br>- select video channel 1. | On PCUs in fwd passenger compartment:<br>- VTR 1 channel 1 audio video program is audible at headset. |
| - select video channel 2. | - VTR 1 channel 2 audio video program is audible at headset. |
| 5. On PCUs in mid passenger compartment:<br>- connect headset.<br>- select video channel 1. | On PCUs in mid passenger compartment:<br>- VTR 2 channel 1 audio video program is audible at headset. |
| - select video channel 2. | - VTR 2 channel 2 audio video program is audible at headset. |
| 6. On PCUs in aft passenger compartment:<br>- connect headset.<br>- select video channel 1. | On PCUs in aft passenger compartment:<br>- VTR 3 channel 1 audio video program is audible at headset. |
| - select video channel 2. | - VTR 3 channel 2 audio video program is audible at headset. |
| 7. On SCU:<br>- press 'MENU' P/BSW. | On SCU:<br>- integral light in 'MENU' P/BSW comes on.<br>- ZONE A, ZONE B, ZONE C, 1 VIDEO, 2 VIDEO, 3 VIDEO and PA touch switches are shown on the LCD touch panel. |
| _ press ZONE A, ZONE B, ZONE C 1 VIDEO and PA touch switches. | |
| - press 'EXEC' P/BSW. | - integral light in 'MENU' P/BSW goes off.<br>- integral light in 'EXEC' P/BSW comes on. |
| - set 'CH1'/'CH2' toggle switch to 'CH1'. | |
| - set 'PA VOLUME' control to an intermediate position. | In passenger compartment:<br>- VTR 1 channel 1 audio video program is audible at all loudspeakers |

| ACTION | RESULT |
|---|---|
| | - VTR 1 channel 1 audio video program is audible at all PCU headsets on all PCU channels. |
| - set 'CH1'/'CH2' toggle switch to 'CH2'. | - VTR 1 channel 2 audio video program is audible at all loudspeakers.<br>- VTR 1 channel 2 audio video program is audible at all PCU headsets on all PCU channels. |
| - turn PA 'VOLUME' control clockwise and counterclockwise. | - audio video program volume varies with position of 'PA VOLUME' control. |
| 8. At purser's station: | |
| - lift handset and make a PA announcement. | - PA announcement is audible over all loudspeakers.<br>- PA announcement is audible at all PCU headsets on all PCU channels. |
| - replace handset. | - VTR 1 channel 2 audio video program is audible at all loudspeakers.<br>- VTR 1 channel 2 audio video program is audible at all PCU headsets on all PCU channels. |
| 9. On SCU: | |
| - touch PA touch switch.<br>- set 'PA VOLUME' control to the'MIN' position. | - audio video program is not audible. |
| 10. On base of relay 19WR in panel 282VU: | On SCU: |
| - bridge contacts A and 2. | - all integral lights in P/BSWs go off.<br>- video program is not shown on LCD screen.<br>On VTR 1, VTR 2 and VTR 3:<br>- all lights go off.<br>In passenger compartment:<br>- video program is not visible on all monitors and flip screens.<br>- audio video program is not audible.<br>- all retractable monitor move to the stowed position. |
| - remove bridge from between contacts A and 2. | On SCU:<br>- integral light in 'SYST PWR' P/BSW comes on.<br>- integral light in 'MENU' P/BSW comes on.<br>- ZONE A, ZONE B, ZONE C, 1 VIDEO, 2 VIDEO, 3 VIDEO and PA touch switches are shown on the LCD touch panel. |

| ACTION | RESULT |
|---|---|
| | - ZONE A, ZONE B and ZONE C touch switches are shown flashing. |
| 11. On SCU: | |
| - press ZONE A and 1 VIDEO touch switches. | |
| - press ZONE B and 2 VIDEO touch switches. | |
| - press ZONE C and 3 VIDEO touch switches. | |
| - press 'EXEC' P/BSW. | - integral light in 'MENU' P/BSW goes off.<br>- integral light in 'EXEC' P/BSW comes on.<br>In passenger compartment:<br>- all retractable monitors move to the viewing position.<br>- video program is shown on all monitors. |
| - press ZONE A and OFF touch switches. | In fwd passenger compartment:<br>- projector stops running. |
| - press ZONE B and OFF touch switches. | In mid passenger compartment:<br>- all monitors go off.<br>- projector stops running. |
| - press ZONE C and OFF touch switches. | In aft passenger compartment:<br>- all monitors go off.<br>- all retractable monitors move to the stowed position. |
| - press 'SYST PWR' P/BSW. | On SCU:<br>- all integral lights are off.<br>- LCD screen is off.<br>On VTR 1 and VTR 2:<br>- all lights are off. |
| 12. On VTR 1, VTR 2 and VTR 3: | |
| - press 'EJECT' P/BSW. | - tape cassettes are ejected from VTRs. |
| - remove tape cassettes. | |

**ON A/C 001-100,

(3)Close-Up
(a)De-energize passenger address system (Ref. 23-31-00, P. Block 501).
(b)De-energize announcement - music tape reproducer system (Ref. 23-32-00, P. Block 501).
(c)De-energize passenger entertainment - music system (Ref. 23-33-00, P. Block 501).
(d)De-energize AC External Power Control (Ref. 24-41-00, P. Block 301).
(e)Make certain that working area is clean and clear of tools and miscel-

laneous items of equipment.

R **ON A/C 101-200,

R (3)Close-Up
R (a)In each viewing zone, unlatch and flip the screen into stowed position
R and ensure frames are correctly seated and locked.
R (b)Refit covers on projector lenses, if fitted.
R (c)De-energize passenger address system (Ref. 23-31-00, P. Block 501).
R (d)De-energize announcement - music tape reproducer system (Ref. 23-32-00,
R P. Block 501).
R (e)De-energize passenger entertainment (music) (Ref. 23-33-00,
R P. Block 501).
R (f)De-energize AC External Power Control (Ref. 24-41-00, P. Block 301).
R (g)Make certain that working area is clean and clear of tools and miscel-
R laneous items of equipment.

## VIDEO MONITOR - REMOVAL/INSTALLATION

**WARNING : VIDEO UNITS ARE HEAVY, HANDLE WITH CARE TO PREVENT INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.**
**WARNING : MAKE CERTAIN THAT ALL SAFETY DEVICES ARE INSTALLED. WHEN REMOVING OR INSTALLING VIDEO EQUIPMENT.**

### 1. Reason for the Job

A. Removal/Installation of monitor and frame in center overhead stowage compartment.

B. Removal/Installation of monitor in galley/stowage.

### 2. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Electrical Ground Power Unit - 3-Phase, 115/200V, 400Hz |
| B. | Video Test Tape P/N: 951-0344-004 |
| Referenced Procedure - 24-41-00, P. Block 301 | AC External Power Control |

### 3. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | VIDEO CONT CTR | 1MM | D 6 |
| 800VU | VIDEO MONITORS AFT | 2MM | D13 |
| 800VU | VIDEO MONITORS MID | 3MM | D10 |
| 800VU | VIDEO MONITORS FWD | 4MM | D 9 |
| 800VU | VIDEO CONT CTR | 5MM | D 7 |
| 800VU | VIDEO MONITORS AFT | 6MM | D12 |
| 800VU | VIDEO MONITORS MID | 7MM | D11 |
| 800VU | VIDEO MONITORS FWD | 8MM | D 8 |

Monitor in Center Overhead Stowage.
B. Removal (Ref. Fig. 401)
(1)Remove panel to get access to lanyard.
(2)Pull lanyard (9) and lower monitor (2) into servicing position.
(3)Install safety pins (12) into frame.
(4)Remove screws (5), washers (4) and remove shroud (3).
(5)Disconnect electrical connectors (6) and (7).
(6)Remove screws (10), washers (11) and monitor (2) from frame.

C. Installation
(1)Position monitor (2) in frame (8).
(2)Install screws (10) and washers (11).
(3)Connect electrical connectors (6) and (7).
(4)Install shroud (3) with screws (5) and washers (4).
(5)Remove safety pins (12) from frame.
(6)Pull lanyard (9) and return monitor to retracted position.
(7)Install lanyard access panel.
(Ref. Fig. 401)

Retraction Frame
D. Removal (Ref. Fig. 402).
(1)Release cables (3) and (4) from frame (5).
(2)Remove bolts (1) and washers (2).
(3)Remove frame from stowage.

E. Installation
(1)Position frame (5) in stowage.
(2)Install bolts (1) and washers (2).
(3)Reattach cables (3) and (4) to frame.
(Ref. Fig. 402)

Monitor in Galley/Stowage
F. Removal (Ref. Fig. 403).
(1)Release fasteners (5) and remove cover (4).
(2)Support monitor (3), remove pins (6) and pull monitor out to get access to electrical connectors.
(3)Disconnect electrical connectors (1) and (2).
(4)Disengage rollers and remove monitor (3).

G. Installation.
(1)Put monitor (3) in position.
(2)Engage rollers in rails and support monitor.
(3)Connect electrical connectors (1) and (2).
(4)Push monitor into position and secure with pins (6).
(5)Install cover (4) and lock fasteners (5).
(Ref. Fig. 403)

4. Testing
A. Test
(1)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Make certain that electronics rack ventilation is correct.
(3)Remove safety clips and tags, close circuit breakers 1MM thru 8MM.

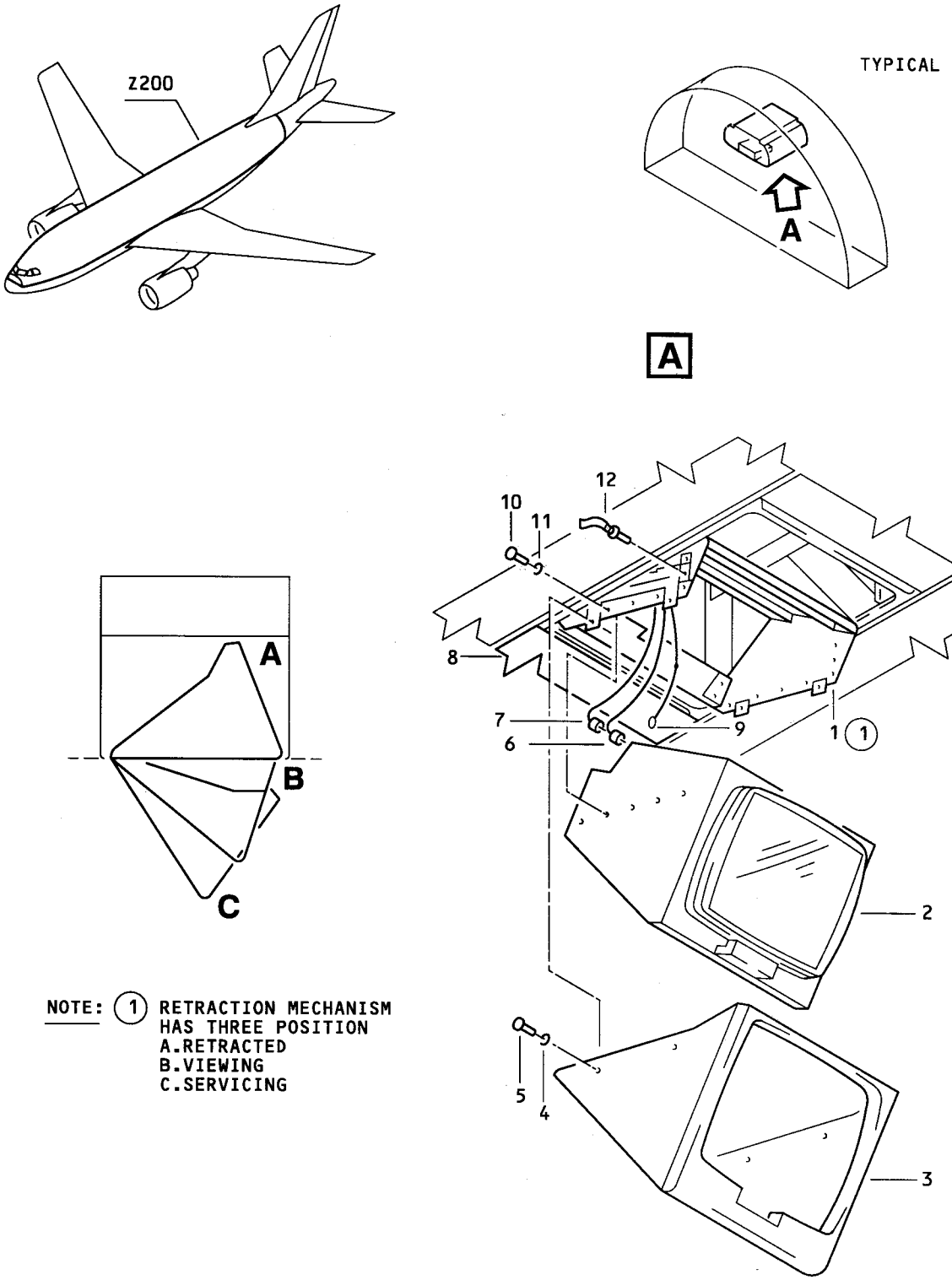
| ACTION | RESULT |
|---|---|
| 1. On SCU:<br>- select SYSTEM POWER on.<br>- select VTR POWER on.<br>- select MONITOR POWER on. | On SCU:<br>- SYSTEM POWER comes on.<br>- VTR POWER comes on.<br>- MONITOR POWER comes on. |
| 2. On VTR:<br>- insert test cassette. | On Control Monitor:<br>- within one min. a clear B/W image |

| ACTION | RESULT |
|---|---|
| - press PLAY pushbutton. | appears on control monitor.<br>In Passenger Compartment:<br>- within one min. a clear color image appears on monitors. |
| 3. On VTR:<br>- Press STOP pushbutton.<br>- press REW pushbutton.<br>- press EJECT pushbutton. | On VTR:<br>- tape stops.<br>- tape rewinds.<br>- cassette is ejected. |
| 4. On SCU:<br>- select MONITOR POWER off.<br>- select VTR POWER off.<br>- select SYSTEM POWER off. | On SCU:<br>- MONITOR POWER goes off.<br>- VTR POWER goes off.<br>- SYSTEM POWER goes off. |

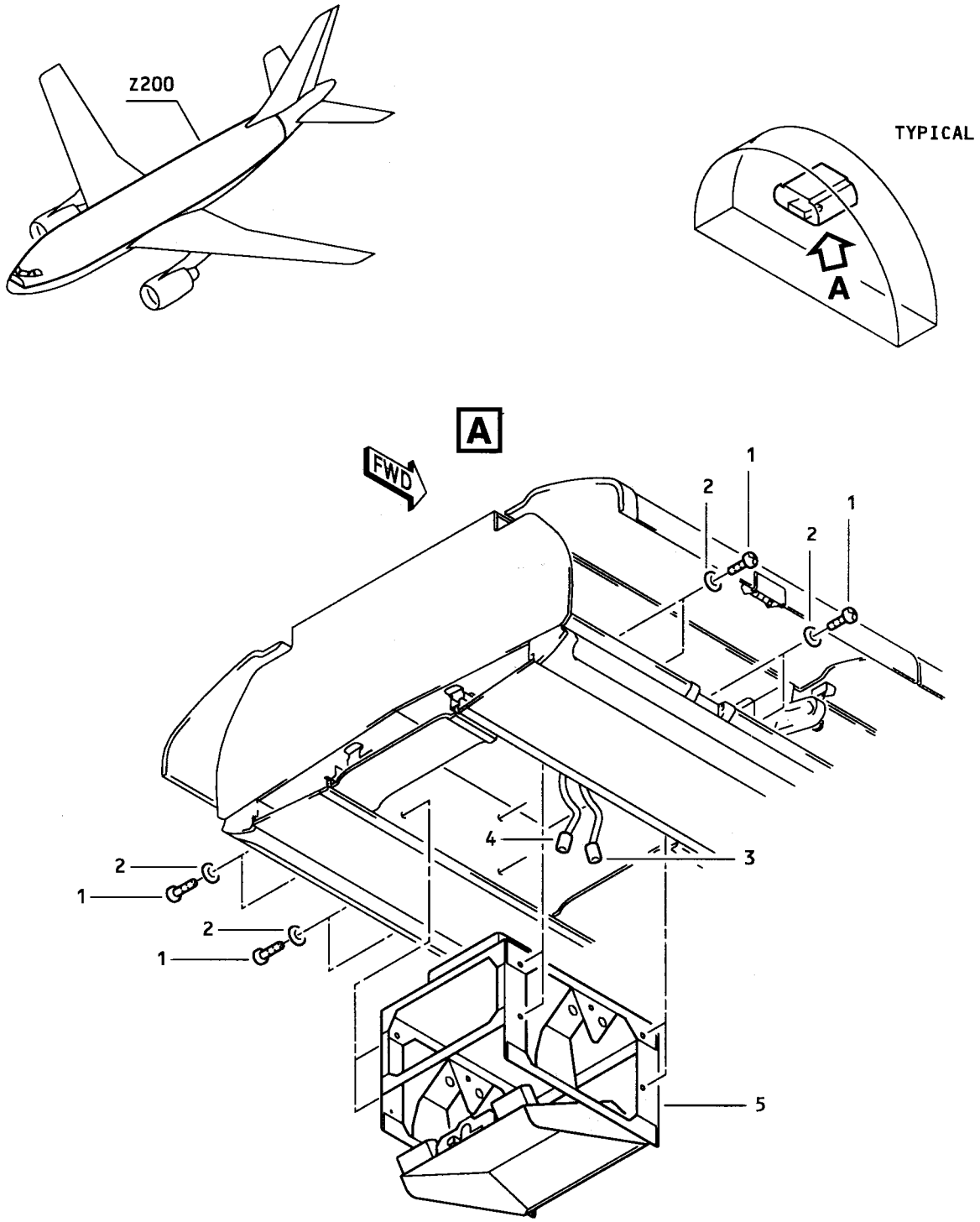
B. Close-Up

(1) De-energize electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).

(2) Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

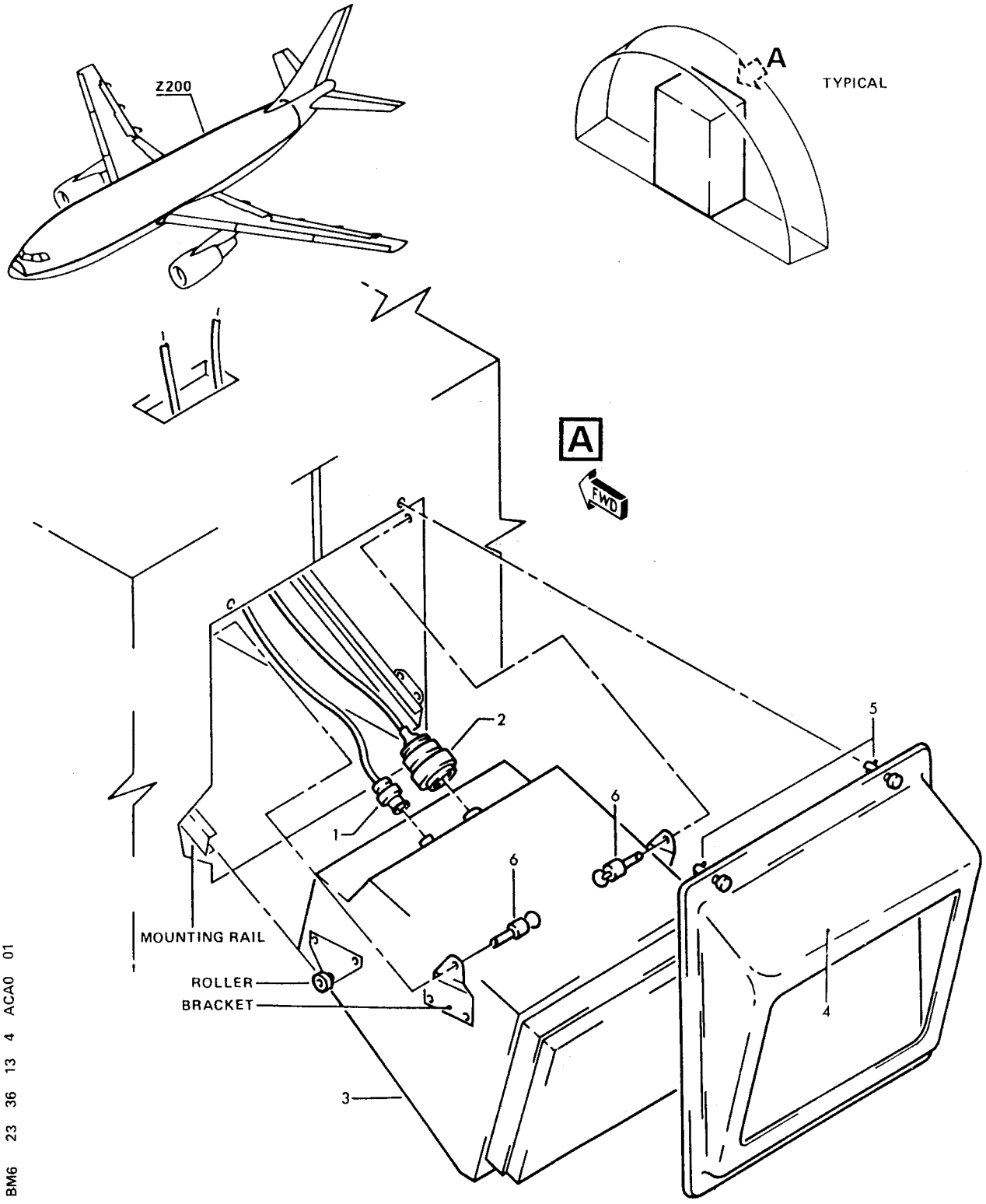



Video Monitor - Center Overhead Stowage Compartment
Figure 401




BM6 23 36 13 4 ABA0 01

Monitor Retraction Frame
Figure 402




Monitor in Galley/Stowage
Figure 403

WARNING : ISOLATE THE ELECTRICAL CIRCUITS FROM THE RELATED EQUIPMENT.

R **ON A/C 105-200,

R 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Electrical Ground Power Unit - 3 Phase, 115/200 V, 400 Hz |
| Referenced Procedure - 24-41-00, P. Block 301 | AC External Power Control |

R 2. Procedure

R A. Job Set-Up
R (1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | VIDEO CONT CTR | 1MM | D 6 |
| 800VU | VIDEO MONITORS AFT | 2MM | D13 |
| 800VU | VIDEO MONITORS MID | 3MM | D10 |
| 800VU | VIDEO MONITORS FWD | 4MM | D 9 |
| 800VU | VIDEO CONT CTR | 5MM | D 7 |
| 800VU | VIDEO MONITORS AFT | 6MM | D12 |
| 800VU | VIDEO MONITORS MID | 7MM | D11 |
| 800VU | VIDEO MONITORS FWD | 8MM | D 8 |

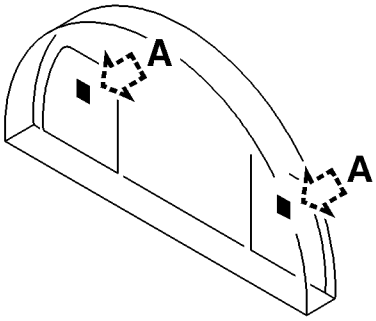
B. Removal
(1)Remove the cover (1).
(2)Disconnect the electrical connectors (2).
(3)Put blanking caps on the disconnected electrical connectors.
(4)Remove the screws (3) and washers (4).
(5)Remove the mounting plate (5) together with LCD monitor.
(6)Remove the screws (6) from the rear side of mounting plate (5).
(7)Remove the LCD Monitor (7).

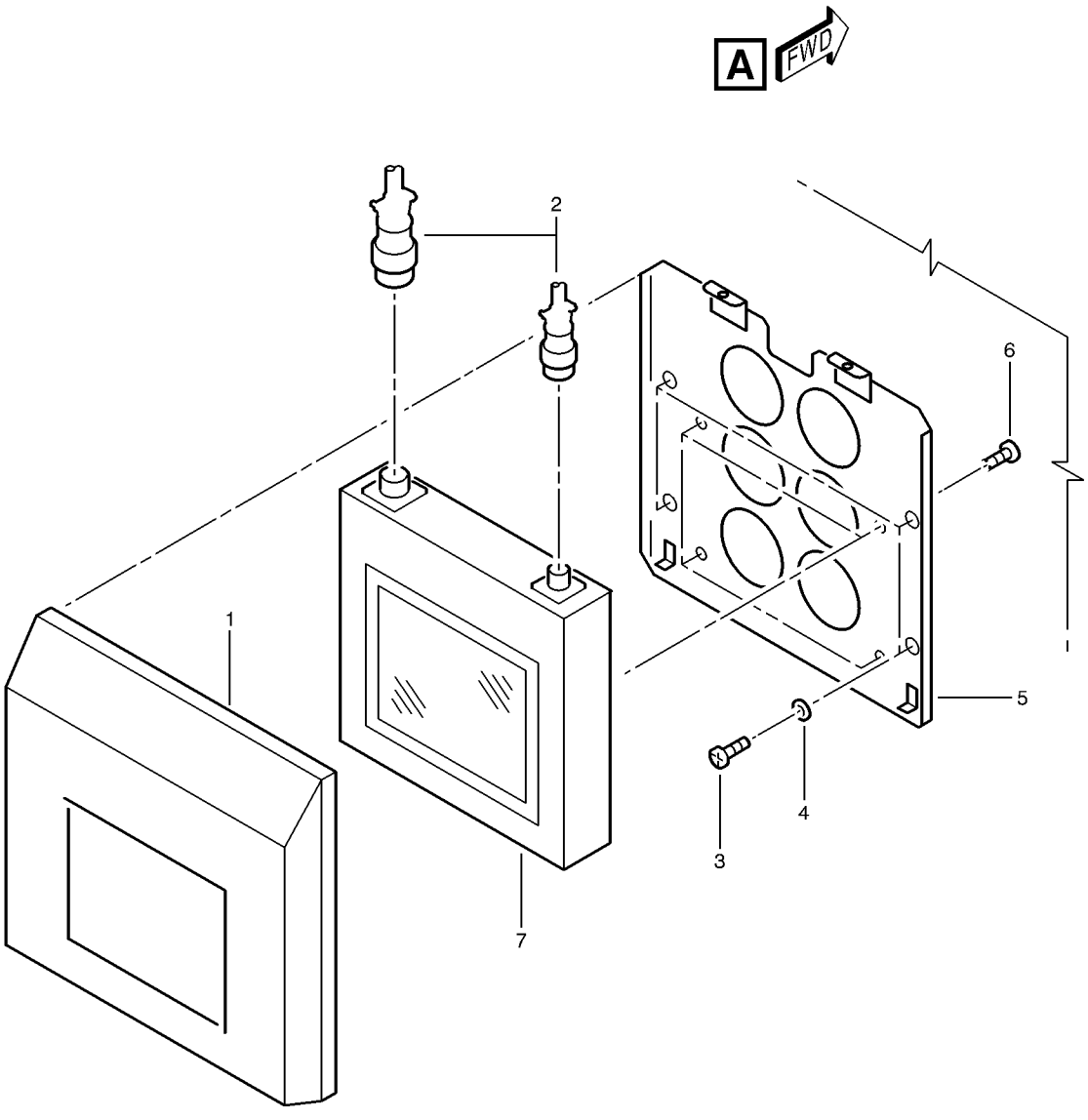
C. Installation
(1)Install the LCD Monitor (7) on the mounting plate (5) with srews (6).
(2)Install the mounting plate (5) with screws (3) and washers (4).
(3)Remove the blanking caps from the electrical connectors (2).
NOTE : Make sure that the electrical connectors are clean and in good condition.
(4)Connect the electrical connectors (2).
(5)Install the cover (1).
R (Ref. Fig. 401) *

R D. Test *
R Carry out the test of the passenger entertainment video system *
R (Ref. 23-36-00, P. Block 501). *

R E. Close-Up *
R (1)De-energize the electrical network and disconnect the ground power *
R unit (Ref. 24-41-00, P. Block 301). *
R (2)Make sure the working area is clean and clear of tools and *
R miscellaneous items of equipment. *

EXAMPLE




BM6 23 36 14 4 ABD0 00

R LCD Monitor *
Figure 401

WARNING: ISOLATE THE ELECTRICAL CIRCUITS FROM THE RELATED EQUIPMENT AND THE ENVIRONMENT.

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Blanking Caps |
| B. | Electrical Ground Power Unit - 3 Phase, 115/200 V, 400 Hz |
| C. | Video Test Tape (VHS)<br>TRANS COM P/N: 951-0344-004 |
| D. | Electric Headset |

Referenced Procedures

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |

2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers:

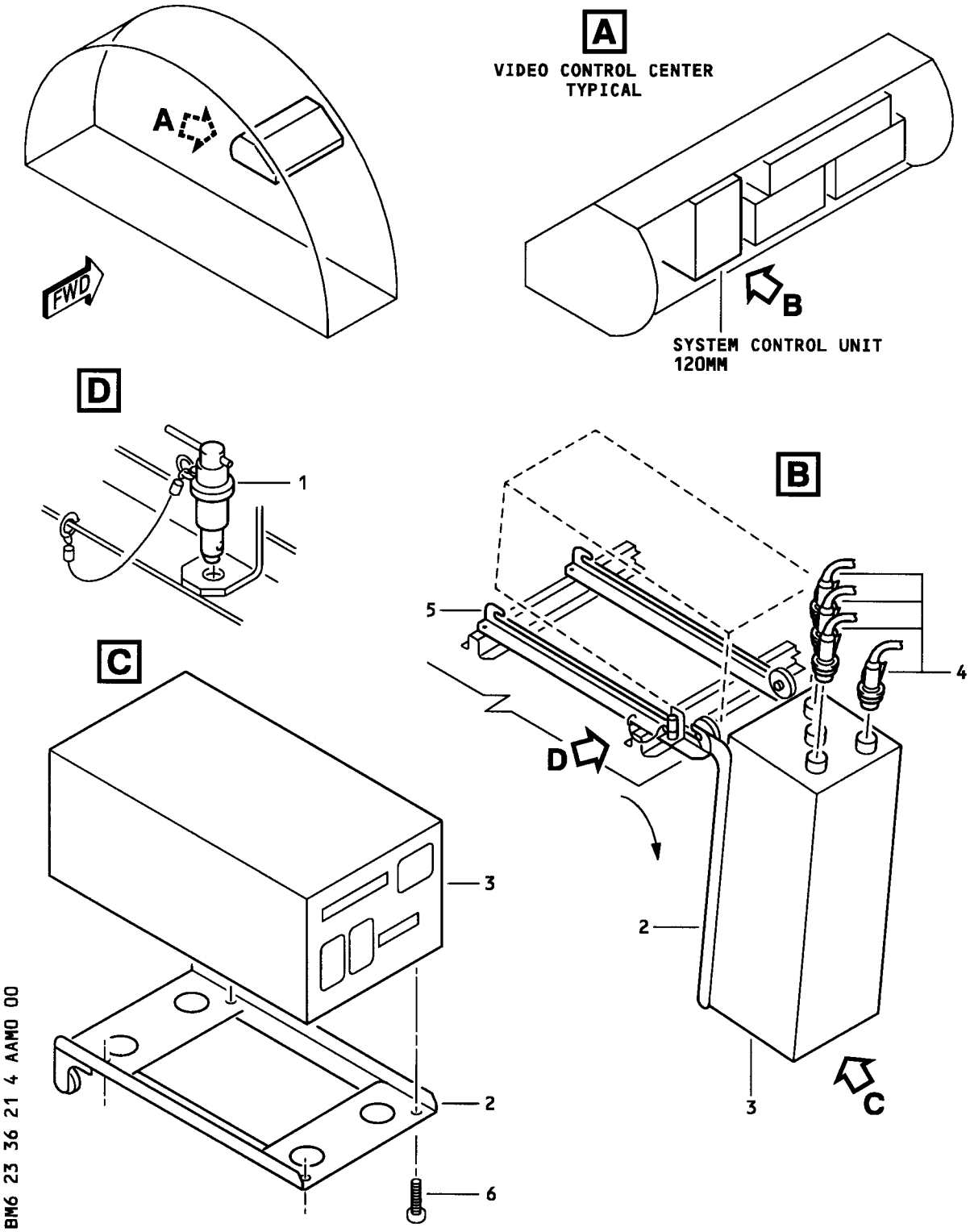
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | VIDEO CONT CTR | 1MM | D 6 |
| 800VU | VIDEO MONITORS AFT | 2MM | D13 |
| 800VU | VIDEO MONITORS MID | 3MM | D10 |
| 800VU | VIDEO MONITORS FWD | 4MM | D 9 |
| 800VU | VIDEO CONT CTR | 5MM | D 7 |
| 800VU | VIDEO MONITORS AFT | 6MM | D12 |
| 800VU | VIDEO MONITORS MID | 7MM | D11 |
| 800VU | VIDEO MONITORS FWD | 8MM | D 8 |

B. Removal
(1)Open the doors of the video control center.
(2)Remove the quick-release pins (1).
(3)Lift the sliding base (2) in front of the SCU (3).
(4)Pull out the sliding base (2) from rack (5) carefully, together with the SCU (3) up to the sliding base stops.
(5)Let down the sliding base to get access to the electrical connectors.
(6)Disconnect the electrical connectors (4).
(7)Put blanking caps on the disconnected electrical connectors.

WARNING : AFTER REMOVING SCREWS (6) MAKE SURE THAT THE SCU WILL NOT DROP DOWN.

(8)Remove the screws (6) and lift the SCU (3) from the sliding base (2).

C. Installation
(1)Install the SCU (3) on the sliding base (2) with the screws (6).
(2)Remove the blanking caps from the electrical connectors (4).
NOTE : Make sure that the electrical connectors are clean and in good condition.
(3)Connect the electrical connectors (4).
(4)Slide the sliding base (2) into the rack (5) carefully, together with the SCU (3).
(5)Insert the quick-release pins (1).
(Ref. Fig. 401)




System Control Unit
Figure 401

D. Test
Remove safety clips and tags, close circuit breakers 1MM thru 8MM.
Carry out the test of the passenger entertainment video system (Ref. 23-36-00, P. Block 501).

E. Close-Up
(1) Open circuit breakers 1MM thru 8MM.
(2) De-energize electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).
(3) Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

**WARNING : ISOLATE THE ELECTRICAL CIRCUITS FROM THE RELATED EQUIPMENT.**

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Blanking Caps |
| B. | Electrical Ground Power Unit - 3 Phase, 115/200 V, 400 Hz |
| C. | Video Test Tape<br>TRANS COM P/N: 951-0344-004<br>Electric Headset |
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | VIDEO CONT CTR | 1MM | D 6 |
| 800VU | VIDEO MONITORS AFT | 2MM | D13 |
| 800VU | VIDEO MONITORS MID | 3MM | D10 |
| 800VU | VIDEO MONITORS FWD | 4MM | D 9 |
| 800VU | VIDEO CONT CTR | 5MM | D 7 |
| 800VU | VIDEO MONITORS AFT | 6MM | D12 |
| 800VU | VIDEO MONITORS MID | 7MM | D11 |
| 800VU | VIDEO MONITORS FWD | 8MM | D 8 |

B. Removal
(1)Open the door of the video control center.
(2)Remove the quick-release pins (1).
(3)Lift the sliding base (2) in front of the VTR (3).
(4)Pull out the sliding base (2) from rack (5) carefully, together with the VTR (3) up to the sliding base stops.
(5)Let down the sliding base to get access to the electrical connectors.
(6)Disconnect the electrical connectors (4).
(7)Put blanking caps on the disconnected electrical connectors.

WARNING : AFTER REMOVING SCREWS (6) MAKE SURE THAT THE VTR WILL NOT DROP DOWN.

(8)Remove the screws (6) and lift the VTR (3) from the sliding base (2).

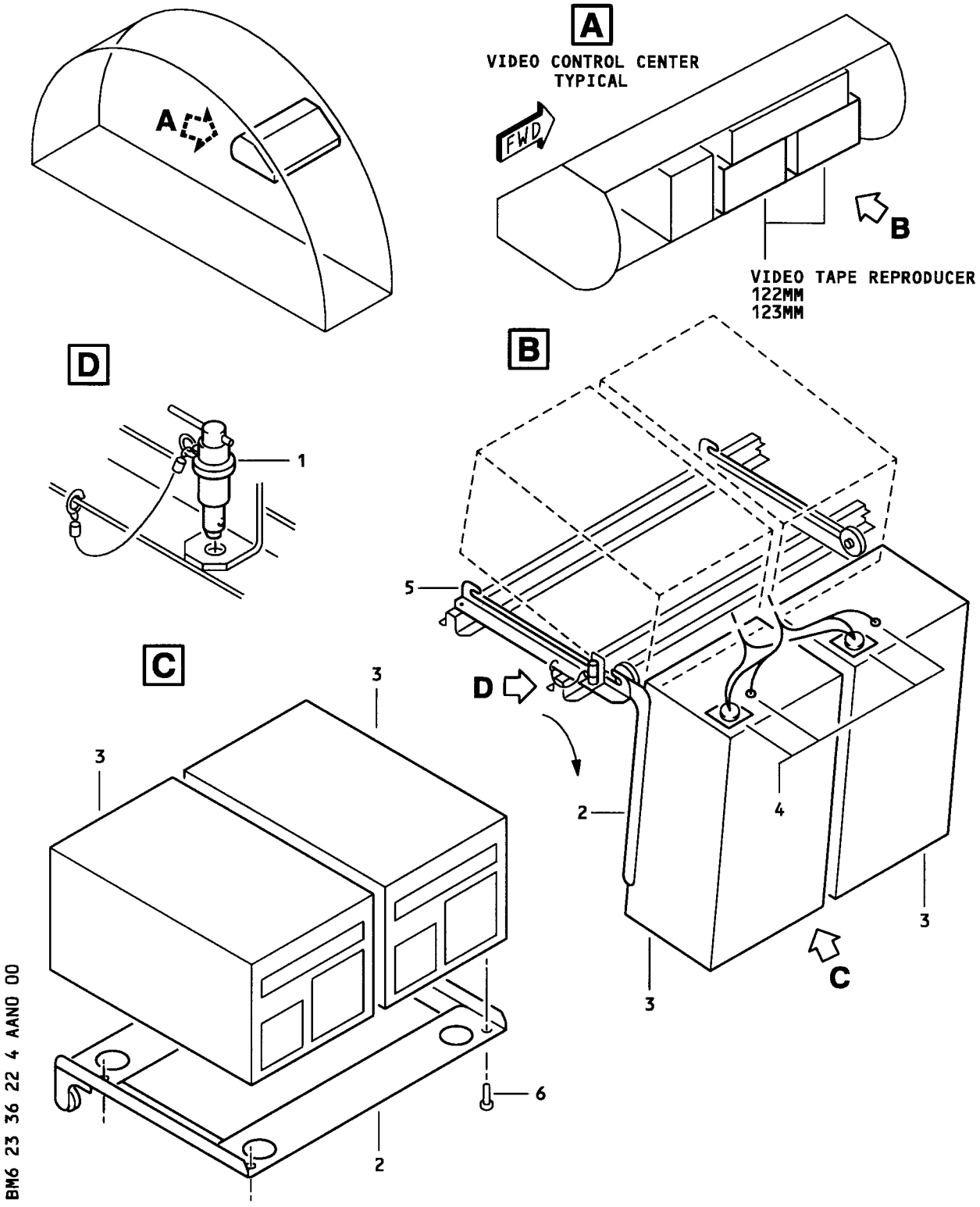
C. Installation
(1)Install the VTR (3) on the sliding base (2) with the screws (6).
(2)Remove the blanking caps from the electrical connectors (4).
NOTE : Make sure that the electrical connectors are clean and in good condition.
(3)Connect the electrical connectors (4).
(4)Slide the sliding base (2) into the rack (5) carefully, together with the VTR (3).
(5)Insert the quick-release pins (1).
(Ref. Fig. 401)

D. Test
(1)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Make certain that electronics rack ventilation is working.
(3)Remove safety clips and tags, close circuit breakers 1MM thru 8MM.
(4)Make sure that PA rotary knob is set to 'OFF' position.

| ACTION | RESULT |
|---|---|
| 1. On SCU:<br>- press P/B SYSTEM POWER to on position.<br>- press P/B SOURCE to select VTR1 (VTR2 . | On SCU:<br>- integral light in P/B SYSTEM POWER comes on.<br>- indicator light VTR1 (VTR2) comes on. |
| 2. On VTR1 (VTR2):<br>- insert test cassette<br>- press P/B PLAY. | On VTR1 (VTR2):<br>- the VTR is active.<br>On SCU Monitor:<br>- monitor comes on.<br>- within 1 min., a clear and undistorted video picture appears on the monitor. |
| NOTE : Program images must be displayed for a minimum of 5 min. to verify image stability. | |
| 3. On SCU:<br>- connect headset. | On SCU:<br>- the audio program from VTR1 |

| ACTION | RESULT |
|---|---|
| | (VTR2) is clear and undistorted |
| - disconnect headset. | |
| 4. On VTR1 (VTR2): | On VTR1 (VTR2): |
| - press P/B STOP. | - video tape stops. |
| - press P/B REW. | - video tape is rewound and stops. |
| - press P/B EJECT. | - the cassette is ejected |
| 5. On SCU: | On SCU: |
| - press P/B SOURCE to off position. | - integral light in P/B SOURCE goes off. |
| - press P/B SYSTEM POWER to off position. | - integral light in P/B SYSTEM POWER goes off. |

E. Close-Up
(1)Close the door of the video control center.
(2)Open circuit breakers 1MM thru 8MM.
(3)De-energize electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).
(4)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.




Video Tape Reproducers
Figure 401

R **ON A/C 101-200,

1. General

The Airshow System is installed to provide inflight visual information to the passenger via the video system. The visual information system uses navigation data and air data from the Flight Management Computer (FMC) and the Air Data Computer (ADC). This information is displayed on the video system. The system consists of the Airshow Computer Digital Interface Unit (DIU) and the Airshow Control Panel.
Information displayed includes:
- maps, which indicate the aircraft position
- flight information, e.g. ground speed, wind speed, altitude, outside air temperature and distance from destination.

R **ON A/C 001-100,

1. General

The Passenger Info-Airshow system is installed to provide the passenger with service and flight information via the Passenger Entertainment Video system (PES-video). The Passenger Info-Airshow system receives the flight information from Electrical Clocks (FS) system, Air Data Computer (ADC) and from Flight Management Computer (FMC).

R **ON A/C ALL

2. Component Location

R **ON A/C 001-100,

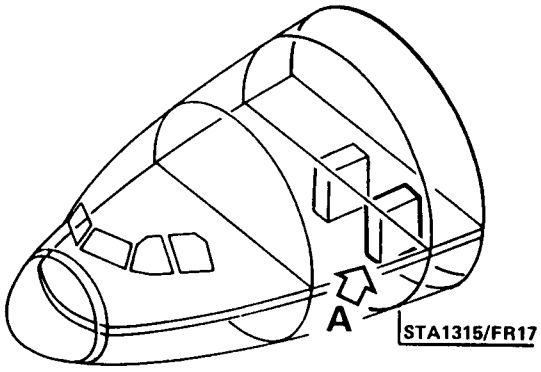
(Ref. Fig. 001)

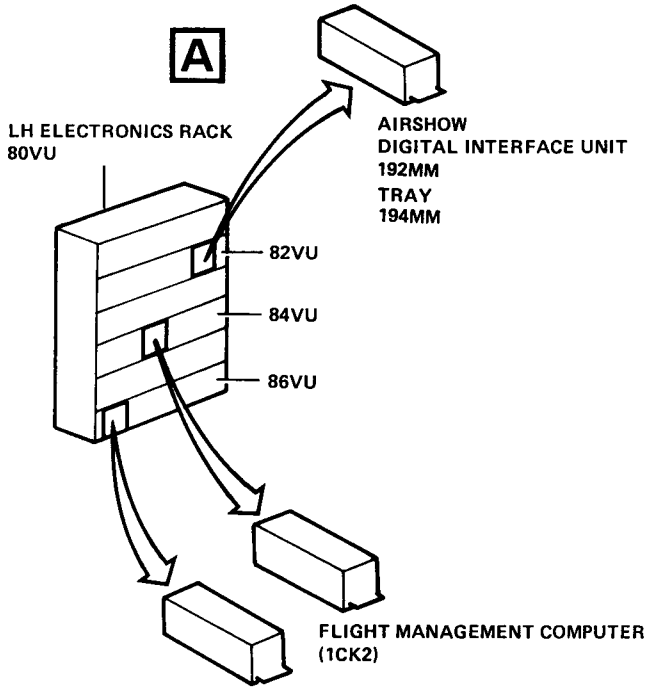
R **ON A/C 101-200,

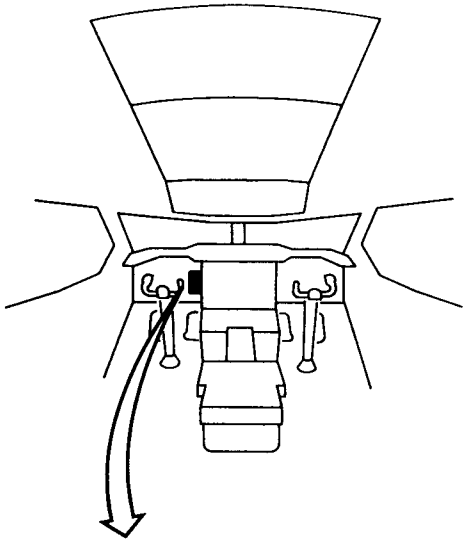
R (Ref. Fig. 002)

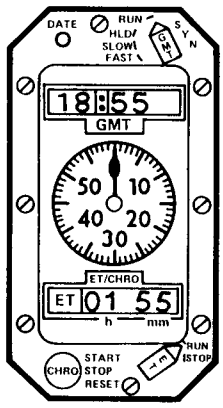
| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 191MM | AIR SHOW CONTROL UNIT | | 251 | | |
| 192MM | DIGITAL INTERFACE UNIT (DIU) | 82VU | | | |

R **ON A/C 001-100,

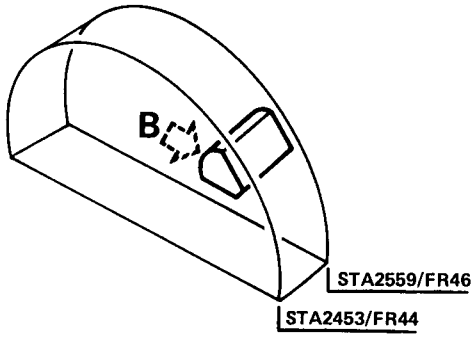


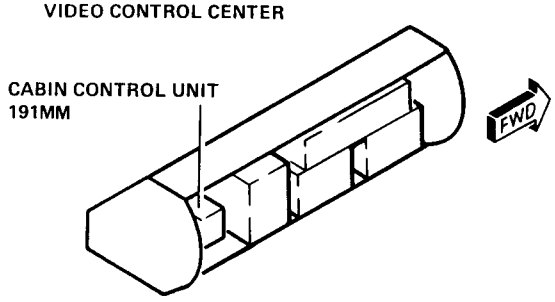





ELECTRICAL CLOCKS

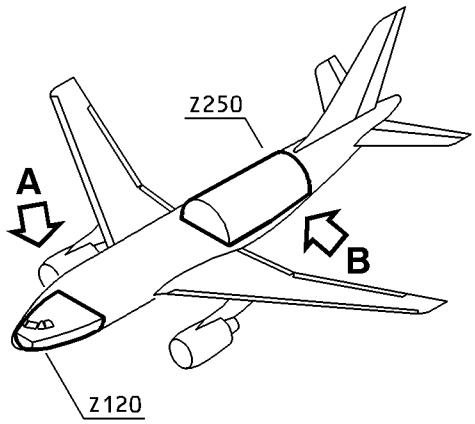


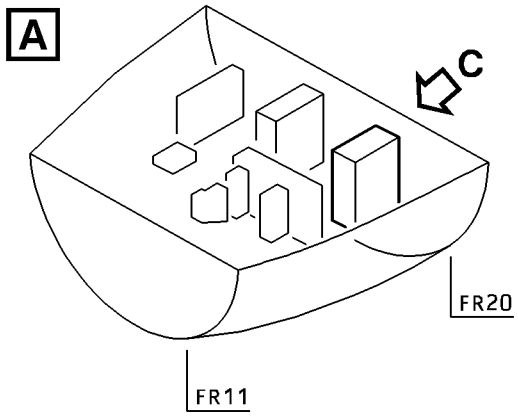

B
VIDEO CONTROL CENTER

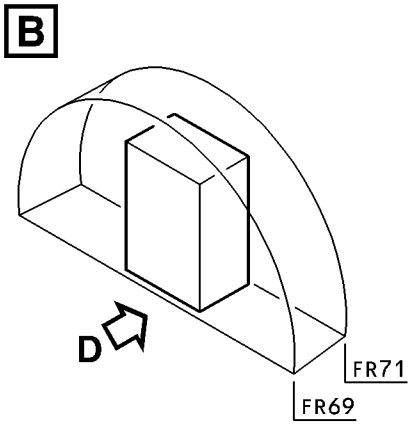


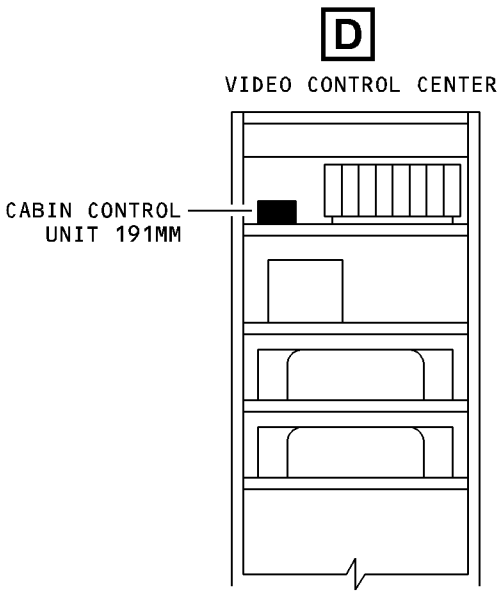

BM6 23 37 00 0 AAXO 00

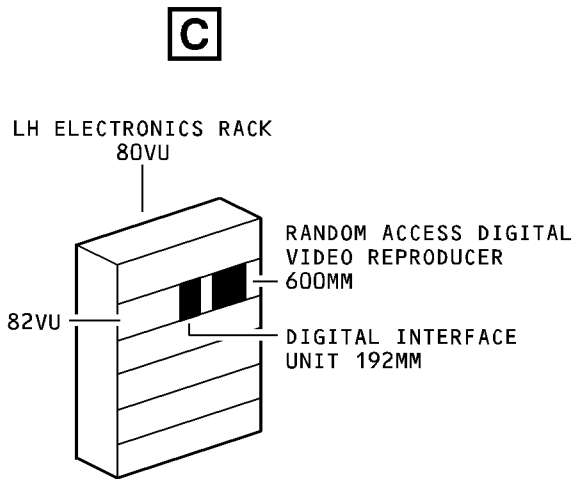
Passenger Information - Airshow System
Location
Figure 001




BM6 23 37 00 0 ABM0 00

Passenger Info - Airshow
Component Location
Figure 002

R

R EFFECTIVITY: 101-200,

PIA

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 191MM | CABIN CONTROL UNIT (CCU) | | 241 | | |
| 192MM | AIRSHOW DIGITAL INTERFACE UNIT | 82VU | 121 | 121BL | |
| 194MM | TRAY FOR AIRSHOW DIGITAL INTERFACE UNIT | 82VU | 121 | 121BL | |

3. System Description

The following main components contain the Passenger Info-Airshow system:
- one cabin control unit (CCU) is installed in the video control center.
- one airshow digital interface unit (airshow DIU) is installed in the electronics rack 80VU.

The Passenger Info-Airshow system is installed to provide the passenger with service- and flight information via the Passenger Entertainment Video system (PES-video). The airshow DIU receives the flight information from Electrical Clocks (FS), Air Data Computer (ADC), Flight Management Computer (FMC) and is processed in the airshow DIU. The main menus and subsequent menus are stored in the airshow DIU memory device which are selected by the CCU. The service- and flight information is given from the airshow DIU via a video transformer to the PES-video and is displayed on the monitors in the viewing zones.

R **ON A/C 101-200,

R 3. System Description

R The system provides passengers with information about the flight, and displays this via the video system. It has the capability to show the actual aircraft position against the registered flight plan on a map display. An additional display shows Altitude, Groundspeed, Outside Air Temperature, Heading, Wind Speed and Wind Direction.
R The Airshow System automatically starts to operate when power is applied in one of the modes.
R Inputs are required from the avionics supply. The modes or inputs are selected on the AIRSHOW CONTROL UNIT (ACU) at the video control center.

R **ON A/C ALL

(Ref. Fig. 003)

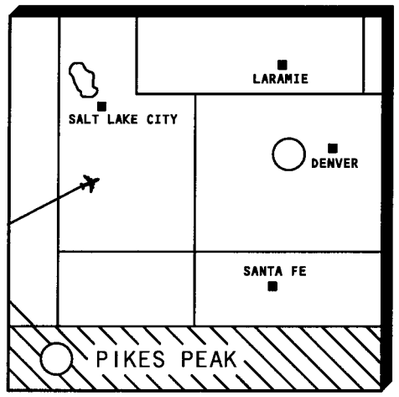
R **ON A/C 001-100,

4. System Power Supply

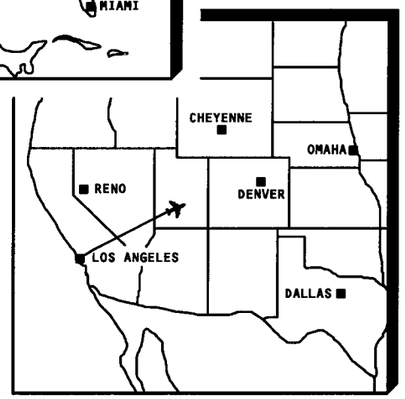
The airshow system is supplied with 28 V DC from the normal busbar 102PP, via circuit breaker 190MM. The circuit breaker is located in panel 800VU. Power is supplied via circuit breaker directly to the airshow DIU and CCU. The components are powered if the circuit breaker is closed.

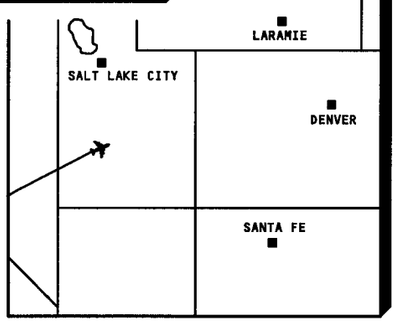
R **ON A/C 101-200,



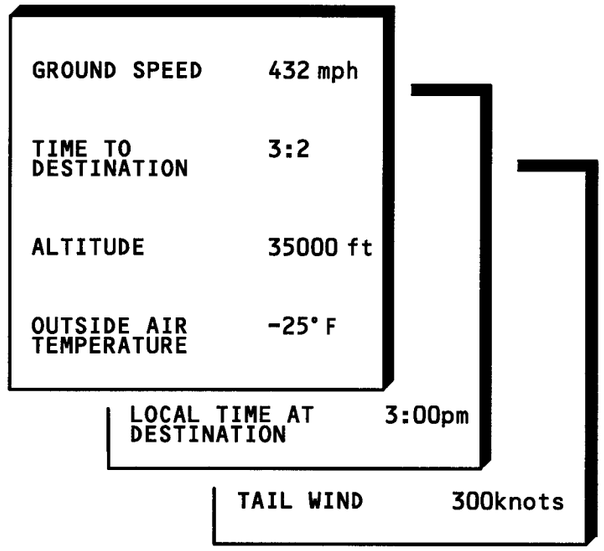




MAP PAGES

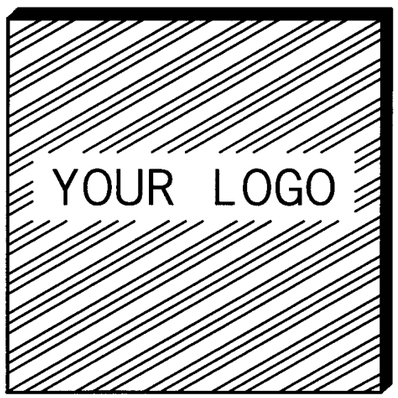



MAP PAGES


GROUND SPEED 432 mph
TIME TO DESTINATION 3:2
ALTITUDE 35000 ft
OUTSIDE AIR TEMPERATURE -25° F
LOCAL TIME AT DESTINATION 3:00pm
TAIL WIND 300knots

INFO PAGES




LOGO PAGE




MAP PAGES

BM6 23 37 00 0 ACS0 00

Passenger Info - Airshow
Airshow Displays
Figure 003

EFFECTIVITY: ALL

R

PIA

R 4. System Power Supply
R The airshow system is supplied with 28 V DC electrical power from the normal
R busbar 102PP, via circuit breaker 190MM. The circuit breaker is located on
R circuit breaker panel 800VU. Power is supplied, via the circuit breaker,
R directly to the airshow digital interface unit and the video control center.

R **ON A/C 001-100,

(Ref. Fig. 004)

R **ON A/C 101-200,

R (Ref. Fig. 005)

R **ON A/C 001-100,

5. Component Description

A. Cabin Control Unit
The Cabin Control Unit (CCU) is used to select the main menus or the subsequent menus. This information of the selected menu is given for distribution to the Passenger Entertainment (Video).
The P/Bs 'Set', 'Down', 'Up' and 'MENU' are used to select one of the seven main menus. The P/Bs are located on the front face, below the display.
It is possible to select the following menus:

(1)SET DISPLAY MODE
The subsequent menus AUTO MODE, MAP MODE, INFO MODE, LOGO MODE, TOTAL ROUTE and TERMINAL MODE are displayed.

(2)SET TIME TO DEST
Time to destination is counted down during the flight, and the duration of flight, until the destination is reached, is shown.

(3)SET DESTINATION
Different destinations are displayed on the subsequent menus.
The DESTINATION menu is used in conjunction with DESTINATION MODE.

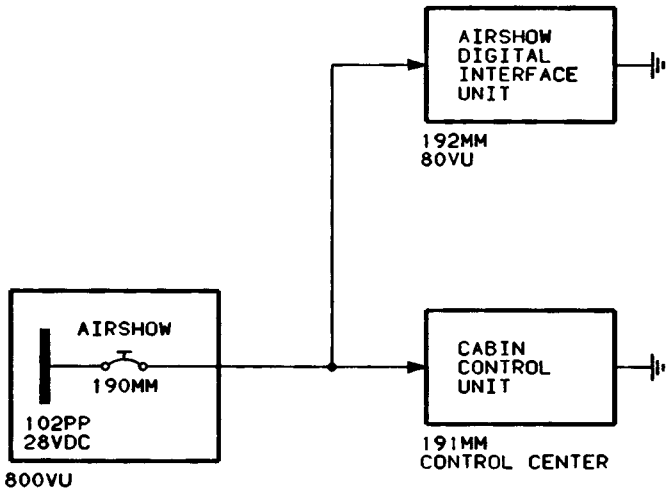
(4)SET LANGUAGES
It is possible to change the languages in this menu.

(5)SET GMT
The setting of GREENWICH MEAN TIME is necessary for updating the accuracy of the internal DIU clock, so that the correct local time and day/date on the INFO page is shown.

(6)DAY/NIGHT VIEWING
It is possible to change the brightness of pictures from DAY VIEWING to NIGHT VIEWING or vice versa.

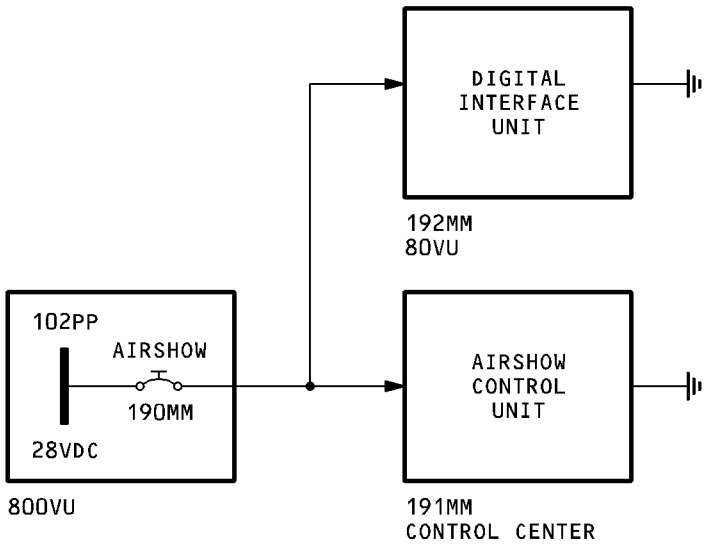
(7)SCREEN BLANKING
The subsequent menus DISABLE BLANKING and ENABLE BLANKING are displayed.

R **ON A/C 101-200,




B M 6 23 37 00 0 AEN0 01

System Power Supply
Figure 004




BM6 23 37 00 0 AEV0 00

System Power Supply
Figure 005

R

5. Component Description

A. Digital Interface Unit
The digital interface unit (DIU) receives data on low speed ARINC 429 digital data buses from:
- Flight Management Computer (FMC) No.2,
- Air Data Computer (ADC) No. 2. and
- Electrical Clocks (FS).

The DIU processes the data inputs and transmit the processed data as a video signal through a video transformer to the video control center. From the video control center, the video signal is transmitted to the monitors in the passenger compartment.

B. Airshow Control Unit (ACU)
The ACU is used to set-up the airshow system.
The four push button switches (P/Bs)
SET, DOWN, UP and MENUE,
which are located on the front face of the ACU, are used for the selection of the set-up menues.
Seven main menues are given for the set-up procedure:

(1)SET DISPLAY MODE
Selection of six subsequent menus are possible:
- AUTO MODE (Automatic cycling of all pictures),
- MAP MODE (Map displays only),
- INFO MODE (Flight Information Pages display only),
- LOGO MODE (Logos / Graphics display only),
- TERM MODE (Airport Terminal Chart displays only),
- CGI MODE (ACAS connecting gate information only).

(2)SET TIME TO DEST
Time to destination is counted down during the flight, and the duration of flight is shown until the destination is reached,.

(3)SET DESTINATION
Different destinations are displayed on the subsequent menus.
The DESTINATION menu is used in conjunction with DESTINATION MODE.

(4)SET LANGUAGES
It is possible to change the languages in this menu.

(5)SET GMT
The setting of GREENWICH MEAN TIME is necessary for updating the accuracy of the internal DIU clock, so that the correct local time and day/date on the INFO page is shown.

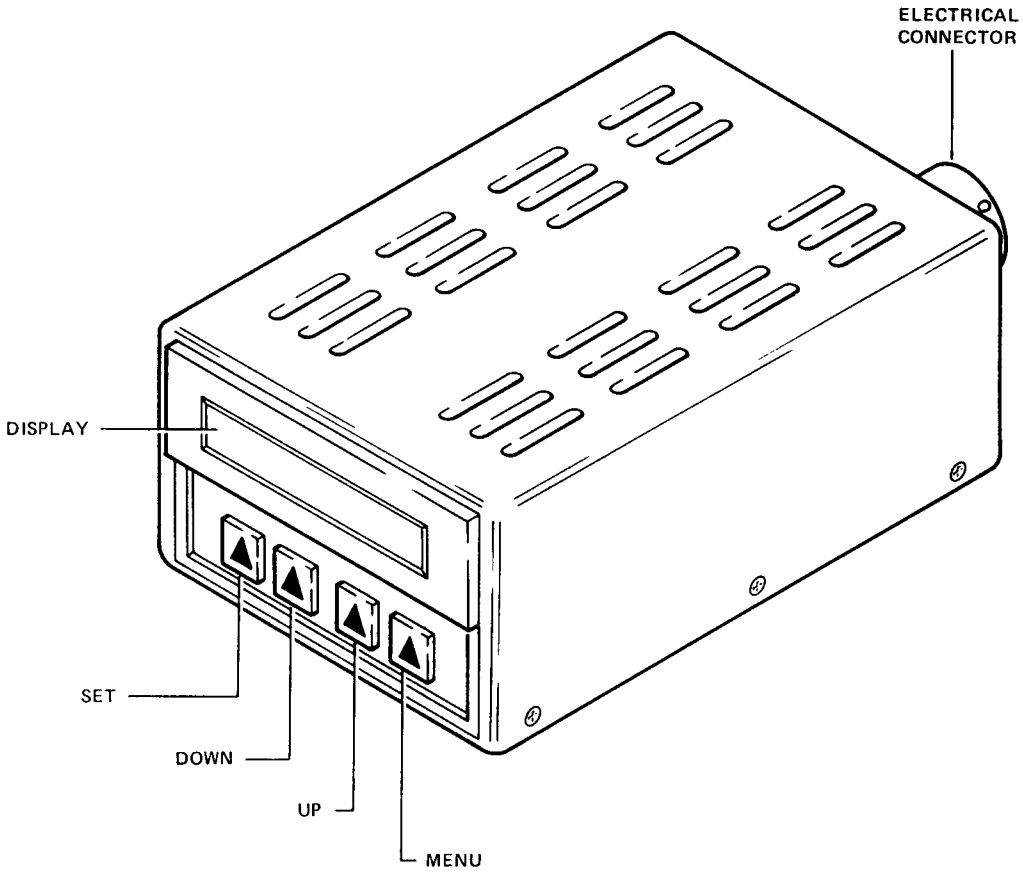
(6)DAY/NIGHT VIEWING
It is possible to change the brightness of pictures from DAY VIEWING to NIGHT VIEWING or VICE VERSA.

(7)SCREEN BLANKING

**ON A/C 001-100,

(Ref. Fig. 006)

**ON A/C 101-200,




BM6 23 37 00 0 AGPO 00

Cabin Control Unit
Figure 006

R (Ref. Fig. 007)

R **ON A/C 001-100,

B. Airshow Digital Interface Unit
The airshow DIU receives flight information from Flight Management Computer (FMC) No.2, Air Data Computer (ADC) No.2. and from Electrical Clocks (FS) via three two wire ARING 429 digital data buses (32 bit binary (BNR) or binary coded decimal (BCD), nominal 7.5 to 13.5 kHz, differential 10 volt). The digital datas are transformed into a NTSC 3.85 MHz. video signal by a video transformer for the video system.
The following labels are contained in ARINC 429:
- label 012 BCD Groundspeed
- label 125 BCD GMT
- label 163 BNR Wind on Nose
- label 203 BNR Pressure Altitude
- label 204 BNR Baro Altitude
- label 205 BNR Mach Number
- label 210 BNR True Airspeed
- label 213 BNR Static Air Temperature
- label 251 BNR Distance to Waypoint
- label 252 BNR Time to Waypoint
- label 260 BCD Date
- label 310 BNR Present Position Latitude
- label 311 BNR Present Position Longitude
- label 312 BNR Groundspeed
- label 313 BNR True Track Angle
- label 314 BNR True Heading
- label 315 BNR Wind Speed
- label 316 BNR Wind Angle
- label 351 BNR Distance to Destination
- label 352 BNR Time to Destination
- label 371 Vendor/Unit ID

The received information is analyzed and processed in the airshow DIU.

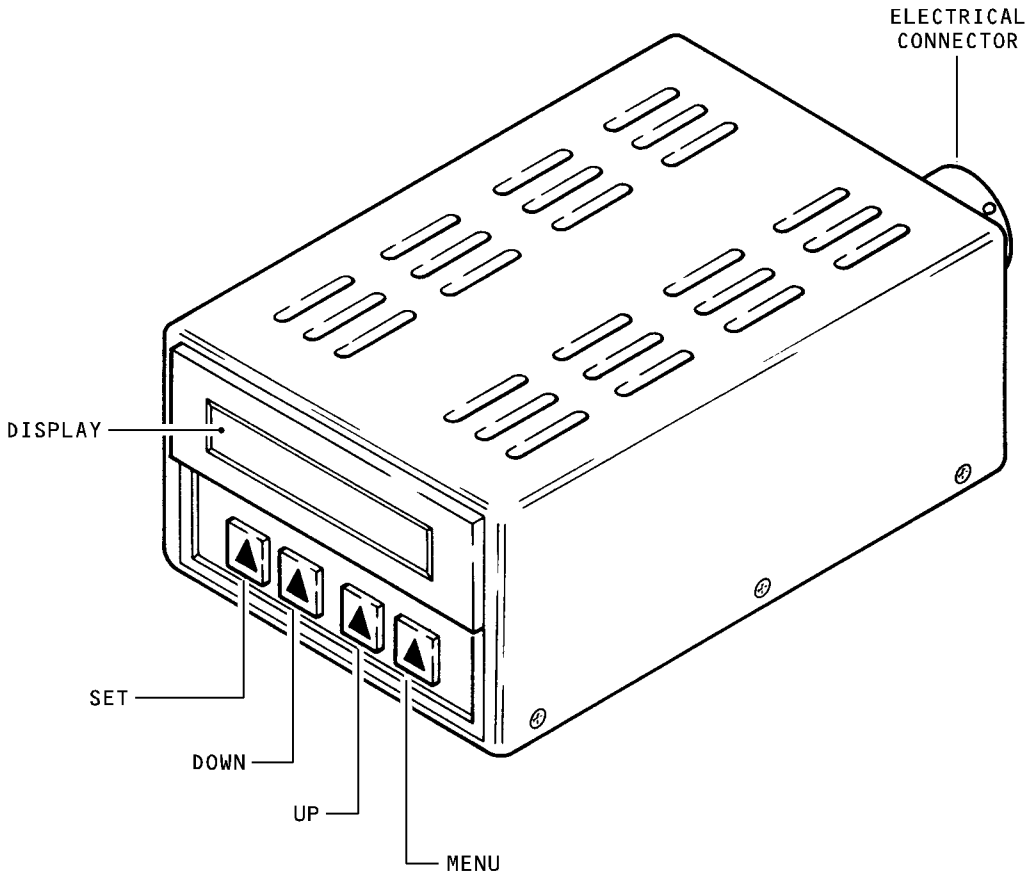
R **ON A/C ALL

(Ref. Fig. 008)

R **ON A/C 001-100,

6. System Operation

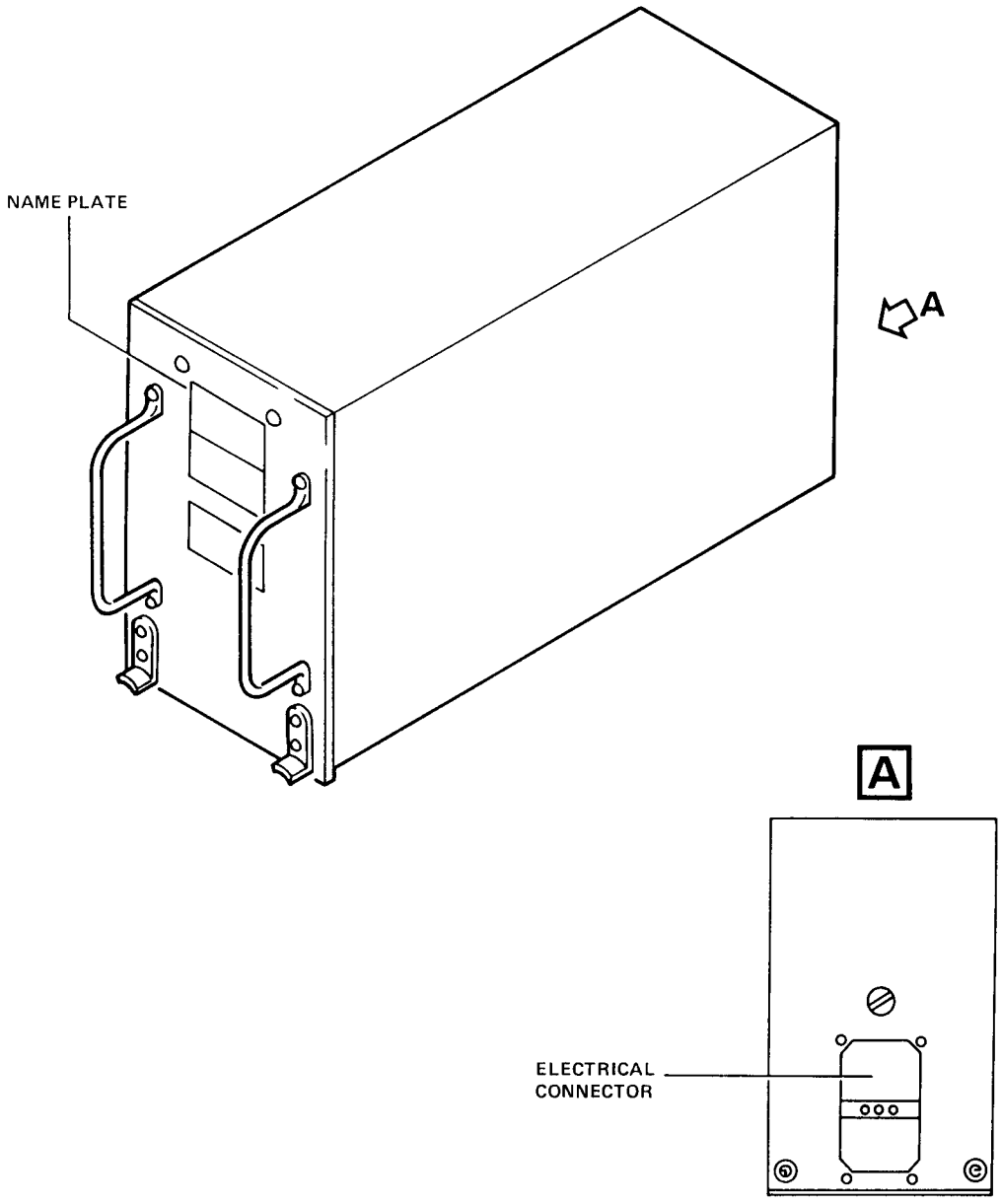
A. When power is supplied to the busbars, the system circuit breaker is closed, the airshow DIU and the CCU is supplied with 28V DC.
The menus are selected and initiated by pressing the P/B UP, DOWN and SET on CCU. The selected menue is given with the respective information from FMC, ADC or ELECTRICAL CLOCKS via the airshow DIU to the video system.
The video zone is activated at the SCU and the service and flight




BM6 23 37 00 0 AGW0 00

Airshow Control Unit
Figure 007

R




BM6 23 37 00 0 ALNO 00

Airshow Digital Interface Unit
Figure 008

information is displayed in the selected video zone.

R **ON A/C 101-200,

R 6. System Operation

R A. When the circuit breaker 190MM is closed and electrical power is supplied
R to the busbar 102PP, the ACU and the DIU are supplied with 28 V DC.
R Four pushbutton switches are installed on the front of the ACU.
R On the ACU LCD-screen the labels for the pushbutton switches are shown.
R The set-up procedure, the operation mode and the selection of a specific
R map or information page is possible.
R The ACU transmits these control signals to the DIU for processing.
R The DIU also receives and stores data from the Flight Management
R Computer No.2, the Air Data Computer No.2 and from the Electrical Clocks.
R The processed data is necessary to produce the map and information pages.
R The control signals from the ACU select the required stored data in the
R DIU. The DIU converts this data into a video signal.
R This video signal is sent through a video transformer to the system
R control unit (SCU). The airshow information is then displayed on the
R passenger compartment monitors.

R **ON A/C 001-100,

(Ref. Fig. 009)

R **ON A/C 101-200,

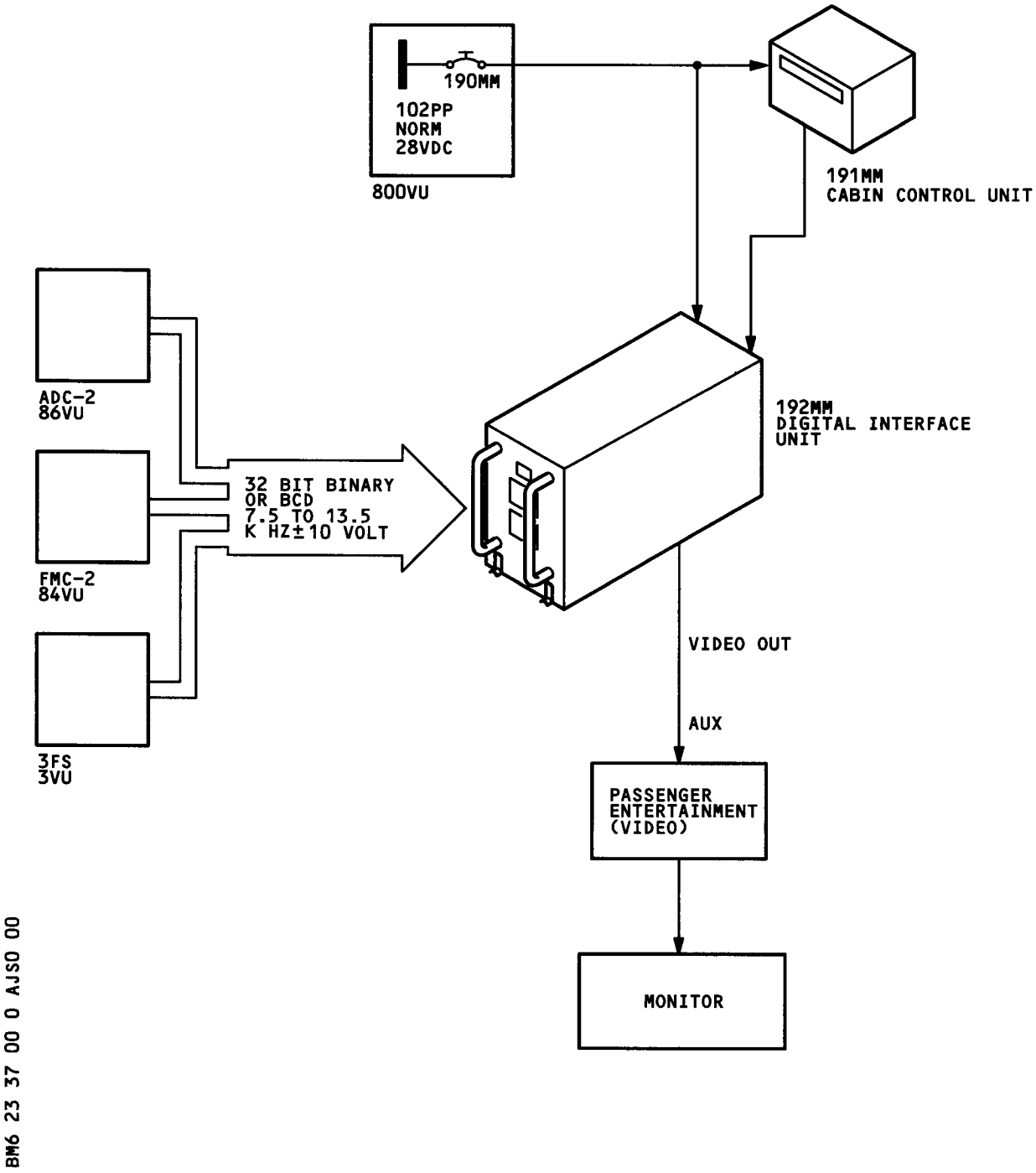
R (Ref. Fig. 010)

R **ON A/C 001-100,

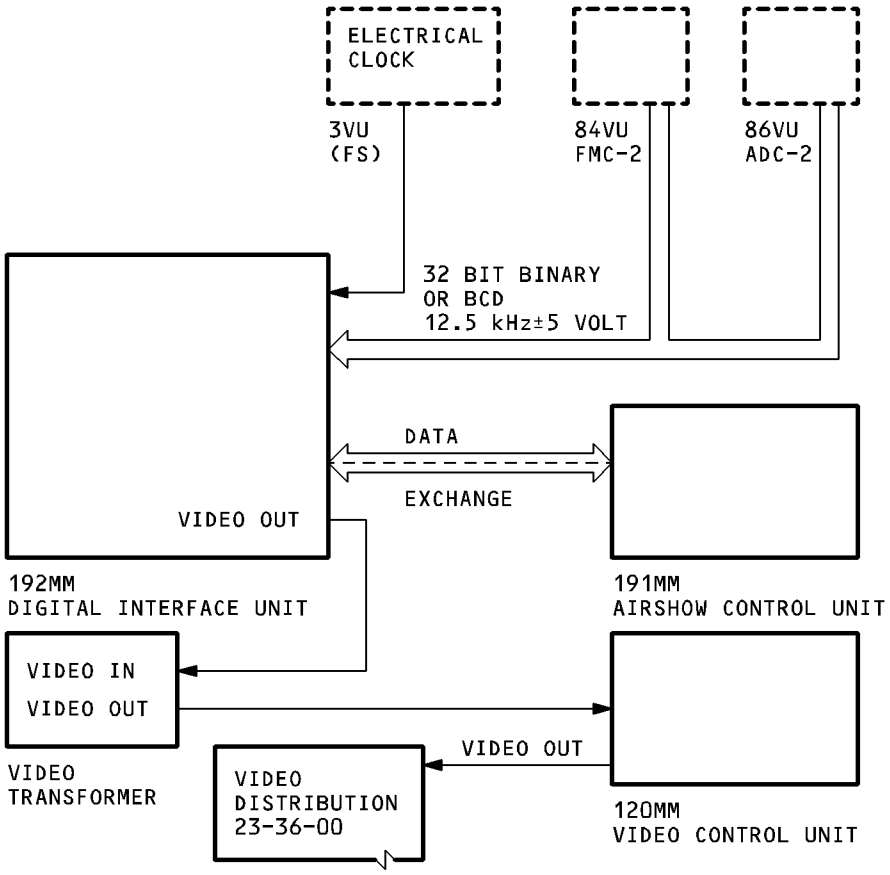
(Ref. Fig. 011)

R **ON A/C 101-200,

R (Ref. Fig. 012)



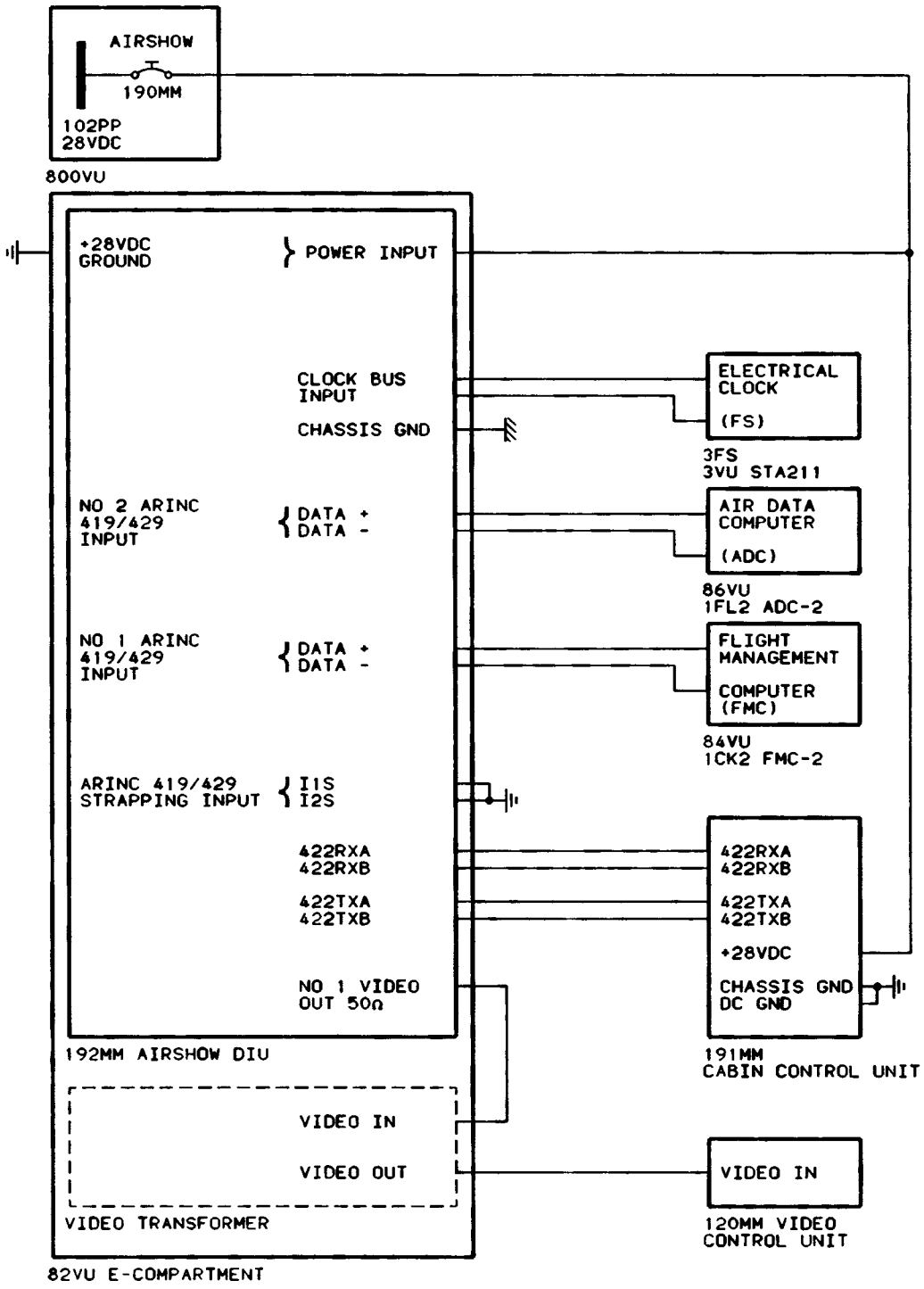

Passenger Information - Airshow
Block Diagram
Figure 009




BM6 23 37 00 0 AJZ0 00

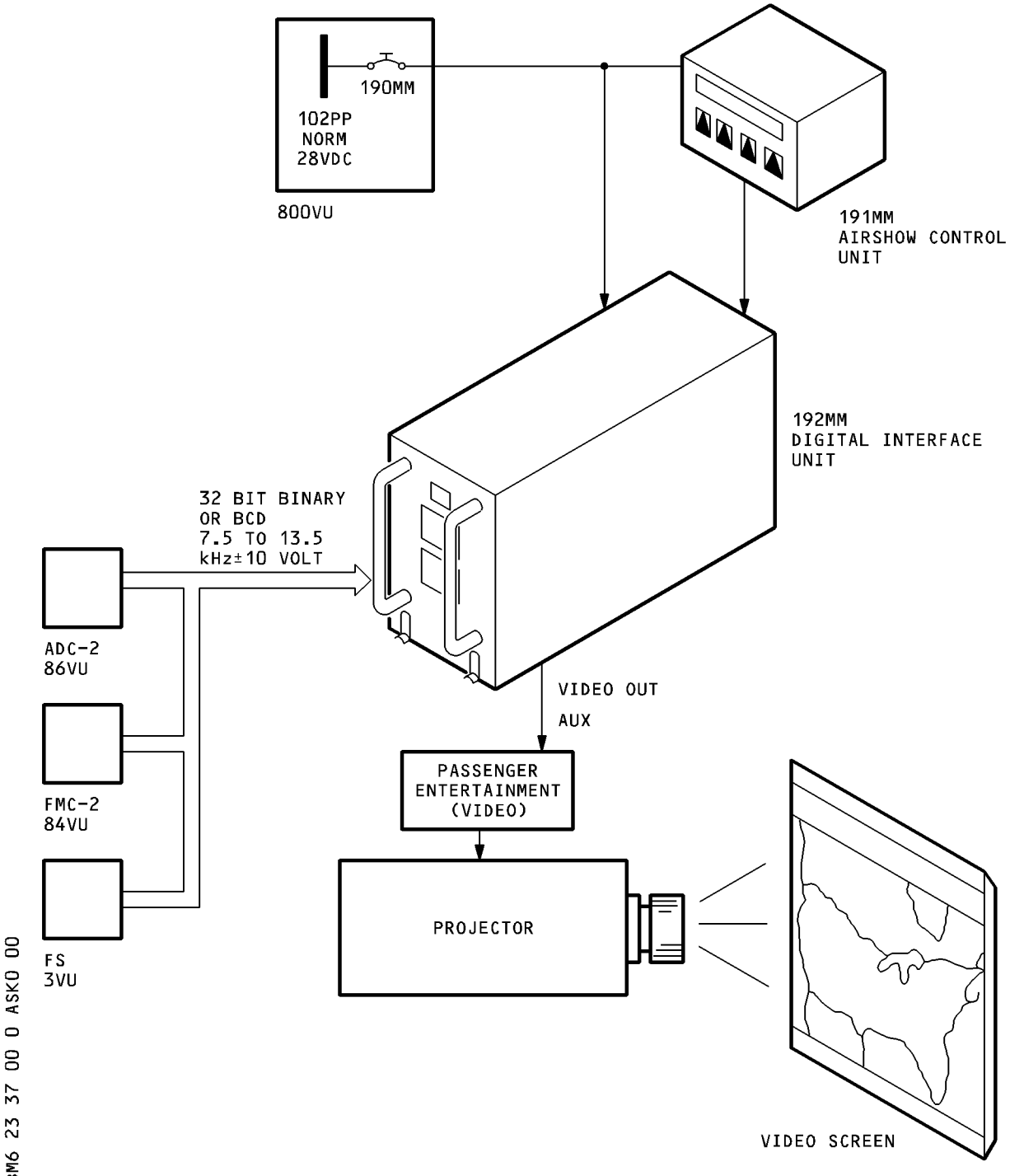
Passenger Info - Airshow
Block Diagram
Figure 010

R




B M 6 23 37 00 0 ASA0 01

Passenger Information - Airshow
Schematic
Figure 011




Passenger Infomation - Airshow System
Schematic
Figure 012

R

1. Operational Test

R **ON A/C 101-200,

A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| 1. | Electrical Ground Power - Unit 3-Phase 115/200 V, 400 Hz |

Referenced Procedures

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 23-36-00, P. Block 501 | Passenger Entertainment (Video) |
| - 34-10-00, P. Block 501 | Flight Environment Data |
| - 34-12-00, P. Block 501 | Altitude |
| - 34-25-00, P. Block 501 | Inertial Reference System (IRS) |
| - 34-60-00, P. Block 501 | Position Computing - General |
| - 34-68-34, P. Block 501 | Flight Management Computer (FMC) |

R **ON A/C 001-100,

A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| 1. | Electrical Ground Power - Unit 3-Phase 115/200 V, 400 Hz |

Referenced Procedures

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 23-36-00, P. Block 501 | Passenger Entertainment (Video) |
| - 34-10-00, P. Block 501 | Flight Environment Data |
| - 34-25-00, P. Block 501 | Inertial Reference System (IRS) |
| - 34-60-00, P. Block 501 | Position Computing - General |

B. Procedure

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.

(1)Job Set Up

(a)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that electronic racks ventilation is correct.

(c)Make certain that the Passenger Entertainment (Video) System is operating (Ref. 23-36-00, P. Block 501).

(d)Make certain that the Flight Environment Data is operating (Ref. 34-10-00, P. Block 501).

(e)Make certain that the Inertial Reference System (IRS) is operating (Ref. 34-25-00, P. Block 501).
(f)Make certain that the Position Computing - General is operating, (Ref. 34-60-00, P. Block 501).
(g)For projectors only, remove protective covers from lens, and put the screens into the viewing position.
(h)Make certain that the following circuit breakers are opened:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | VIDEO AIRSHOW | 190MM | D 5 |
| 21VU | ADS ADC2 26 V AC | 8FL2 | E 9 |
| 21VU | ADS ADC2 115 V AC | 9FL2 | E10 |
| 21VU | NAVIGATION IRS 2 115V AC | 312FP2 | E12 |
| 21VU | NAVIGATION IRS 2 BAT | 313FP2 | E13 |
| 21VU | FMS SYS 2 DIM | 5CK2 | J13 |
| 21VU | FMS SYS 2 SUPPLY | 4CK2 | J14 |

R **ON A/C 101-200,

R B. Procedure
R WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT MAKE CERTAIN THAT
R ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.
R (1)Job Set-Up
R (a)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
R (b)Make certain that electronic racks ventilation is correct.
R (c)Make certain that the Passenger Entertainment (video) is operating (Ref. 23-36-00, P. Block 501).
R (d)Make certain that the Air Data System No. 2 is operating (Ref. 34-10-00, P. Block 501).
R (e)Make certain that the Altitude Data is operating (Ref. 34-12-00, P. Block 501).
R (f)Make certain that the Inertial Reference System (IRS) is operating (Ref. 34-25-00, P. Block 501).
R (g)Make certain that the Flight Management System No. 2 is operating, (Ref. 34-60-00, P. Block 501).
R (h)Make certain that the Flight Management Computer (FMC) is operating (Ref. 34-68-34, P. Block 501).
R (j)Make certain that the following circuit breaker is closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | VIDEO AIRSHOW | 190MM | D5 |

R (k)Energize the Passenger Entertainment System.
R (l)Make certain that the following circuit breakers are opened:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | ADS ADC2 26 V AC | 8FL2 | E 9 |
| 21VU | ADS ADC2 115 V AC | 9FL2 | E10 |
| 21VU | FMS SYS DIM | 5CK2 | J13 |
| 21VU | FMS SYS SUPPLY | 4CK2 | J14 |
| 21VU | NAVIGATION IRS 115 V AC | 312FP2 | E12 |
| 21VU | NAVIGATION IRS 2 BAT | 313FP2 | E13 |

**ON A/C 001-100,

(2)Test
(a)Test of airshow system without data from the Flight Management Computer (FMC) and Air Data Computer (ADC).

| ACTION | RESULT |
|---|---|
| 1. On panel 800VU:<br>- close circuit breaker 190MM. | On Cabin Control Unit (CCU):<br>- STANDBY appears on the display during the display test run off.<br>- the cursor is set automatically of SET DISPLAY MODE when the end of test is reached. |
| 2. On video System Control Unit (SCU):<br>- press P/B 'SYSTEM POWER' in ON position. | On SCU:<br>- integral light in P/B 'SYSTEM POWER' comes on.<br>- integral light in P/B ZONE PWR 'OFF' comes on. |
| - press P/B SOURCE SEL 'AUX1' for all zones. | - integral light in P/B 'AUX1' comes on. |
| - press P/B ZONE PWR 'ON' for all zones. | - integral lights in P/B ZONE PWR 'ON' comes on. |
| 3. On CCU:<br>- press P/B 'SET'. | On CCU:<br>- the cursor skipped into the AUTO MODE menue.<br>In passenger compartment: |
| - press P/B 'SET' again. | - the available LOGO, no flight informations and MAPS appear on monitors. |
| - press P/B 'UP' or 'DOWN' to set the cursor on 'MAP MODE'. | |
| - press P/B 'SET'. | - the MAPS appear on the monitors. |
| - press P/B 'UP' or 'DOWN' to set the cursor on 'INFO MODE'. | |
| - press P/B 'SET'. | - no flight informations appear on monitors. |
| - press P/B 'UP' or 'DOWN' to set the cursor on 'LOGO MODE'. | |
| - press P/B 'SET'. | - the available LOGO appears on monitors. |

| ACTION | RESULT |
|---|---|
| 4. On panel 800VU:<br>- open circuit breaker 190MM. | On CCU:<br>- airshow system switched off. |

(b)Test of airshow system with data from the FMC and ADC.
Make certain that the following circuit breakers are closed:

| ACTION | RESULT |
|---|---|
| 1. On panel 21VU:<br>- close circuit breaker 8FL2, 9FL2, 312FP2, 313FP2, 5CK2 and 4CK2. | |
| 2. On panel 800VU:<br>- close circuit breaker 190MM. | On Cabin Control Unit (CCU):<br>- STANDBY appears on the display during the display test run off.<br>- the cursor is set automatically of SET DISPLAY MODE when the end of test is reached. |
| 3. On Mode Selector Unit (MSU) No. 2:<br>- rotate rotary switch in 'NAV' position. | |
| 4. On Inertial System Display Unit (ISDU):<br>- rotate rotary switch DSPL in 'PPOS' position.<br>- rotate rotary switch 'SYS' in position 2.<br>- enter the respective Present Position (PPOS) at the keybord.<br>- rotate rotary switch 'DSPL' in 'TRK/GS' position. | |
| 5. On CCU:<br>- press P/B 'SET'. | - the cursor skipped into the AUTO MODE menue.<br>In passenger compartment: |
| - press P/B 'SET' again. | - the available LOGO, flight informations and MAPS appear on monitors. |
| - press P/B 'UP' or 'DOWN' to set the cursor on 'MAP MODE'. | |
| - press P/B 'SET'. | - the MAPS appear on monitors. |
| - press P/B 'UP' or 'DOWN' to set the cursor on 'INFO MODE'. | |
| - press P/B 'SET'. | - flight informations appear. on monitors. |
| - press P/B 'UP' or 'DOWN' to set the cursor on 'LOGO MODE'. | |
| - press P/B 'SET' | - the available LOGO appears on monitors. |
| 6. On SCU: | On SCU: |

| ACTION | RESULT |
|---|---|
| - press P/B 'SYSTEM POWER' in OFF position. | - the integral lights in SCU go off.<br>In passenger compartment:<br>- the airshow system goes off. |

R **ON A/C 101-200,

R (2)Test
R (a)Test of the airshow system without data from the Flight Management Computer (FMC) and Air Data Computer (ADC).

| ACTION | RESULT |
|---|---|
| 1. On panel 800VU:<br>- close circuit breaker 190MM. | On Airshow Control Unit 191MM (ACU):<br>- STANDBY appears on the display during the display test.<br>- the cursor is set automatically to SET DISPLAY MODE at the end of the display test. |
| 2. On System Control Unit 120MM (SCU):<br>- press'POWER' P/BSW to ON position.<br>- press 'ZONE POWER A ON' P/BSW.<br>- press 'ZONE POWER B ON' P/BSW.<br>- press 'ZONE POWER C ON' P/BSW.<br>- press 'SEL' P/BSW until 'AUX1 PRI' is selected.<br>- press 'SOURCE A' P/BSW until 'AUX1 is selected.<br>- press 'SOURCE B' P/BSW until 'AUX1 is selected.<br>- press 'SOURCE C' P/BSW until 'AUX1 is selected. | On SCU:<br>- integral light in 'POWER' P/BSW comes on.<br>In passenger compartment video zone A:<br>- all monitor screens come on.<br>In passenger compartment video zone B<br>- all retractable monitors extend to the viewing position.<br>- all monitor screens come on.<br>In passenger compartment video zone C<br>- all retractable monitors extend to the viewing position.<br>- all monitor screens come on. |
| 3. On ACU:<br>- press 'SET' P/BSW. | On ACU:<br>- the cursor moves to the AUTO MODE. |

| ACTION | RESULT |
|---|---|
| - press 'SET' P/BSW again. | In passenger compartment:<br>- the logo display is shown on all monitors. |
| - use the 'UP'/'DOWN' P/BSWs to set the cursor to 'MAP MODE'. | |
| - press the 'SET 'P/BSW. | - the map display is shown on all monitors. |
| - use the 'UP'/'DOWN' P/BSWs to set the cursor to 'INFO MODE'. | |
| - press the 'SET' P/BSW. | - no flight information appears on monitors. |
| - use the 'UP'/'DOWN' P/BSWs to set the cursor to 'LOGO MODE'. | |
| - press the 'SET' P/BSW. | - the logo display is shown on all monitors. |
| 4. On panel 800VU:<br>- open circuit breaker 190MM. | On ACU:<br>- airshow system is switched off. |

(b)Test of airshow system with data from the FMC and ADC.
NOTE: Any FROM/TO parameters must be stored in the FMC database.
NOTE: A minimum of 10 minutes must be allowed for IRS alignment.
Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | ADS ADC2 26 V AC | 8FL2 | E 9 |
| 21VU | ADS ADC2 115 V AC | 9FL2 | E10 |
| 21VU | FMS SYS 2 DIM | 5CK2 | J13 |
| 21VU | FMS SYS 2 SUPPLY | 4CK2 | J14 |
| 21VU | NAVIGATION IRS 2 115 V AC | 312FP2 | E12 |
| 21VU | NAVIGATION IRS 2 BAT | 313FP2 | E13 |

| ACTION | RESULT |
|---|---|
| 1. On the mode selector unit (MSU) No. 2:<br>- set rotary switch to the NAV position. | |
| 2. On the flight management system control display unit (FMS CDU):<br>- press the 'INIT' P/BSW. | On the FMS CDU:<br>- the INIT page is shown on the FMS CDU display. |
| - use the alpha/numeric keys to enter a FROM airport code and a TO airport code in the FROM/TO field. | - the FROM/TO code is shown in the FROM/TO field. |
| - press the line select key adjacent to the FROM/TO field. | - the ROUTE SELECTION page is shown on the FMS CDU display. |

| ACTION | RESULT |
|---|---|
| - press the line select key adjacent to the **RETURN** field.<br>- press the line select key adjacent to the align field. | - the **INIT** page is shown on the **FMS CDU** display. |
| 3. On panel 800VU:<br>- close circuit breaker 190MM. | On **ACU**:<br>- **STANDBY** appears on the display during the display test.<br>- the cursor is set automatically to **SET DISPLAY MODE** at the end of the display test. |
| 4. On **ACU**:<br>- use the **'UP'/'DOWN' P/BSWs** to set the cursor to **AUTO MODE**.<br>- press the **'SET' P/BSW**. | In the passenger compartment on all monitors:<br><br>- the logo is shown.<br>- the groundspeed, the altitude and the outside air temperature is is shown.<br>- a local map, showing the present position of the aircraft is shown. |
| 5. On **SCU**:<br>- press **'POWER' P/BSW** to **OFF** position. | On **SCU**:<br>- the integral lights in all **P/BSWs** go off.<br>In the passenger compartment:<br>- all monitor screens go off.<br>- all retractable monitors move to the stowed position. |

**ON A/C 001-100,

(3)Close-Up
(a)In each projector viewing zone, unlatch and flip the screen into stowed position and ensure frames are correctly seated and locked.
(b)Refit covers on projector lenses, if available.
(c)De-energize the aircraft electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).
(d)De-energize the Passenger Entertainment (video) (Ref. 23-36-00, P. Block 501).
(e)De-energize the Flight Environment Data (Ref. 34-10-00, P. Block 501).
(f)De-energize the Inertial Reference System (IRS) (Ref. 34-25-00, P. Block 501).
(g)De-energize the Position Computing - General (Ref. 34-60-00, P. Block 501).
(h)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

R **ON A/C 101-200,

R (3)Close-Up
R (a)De-energize the Position Computing - General (Ref. 34-60-00, P. Block 501).
R (b)De-energize the Altitude Data System (Ref. 34-12-00, P. Block 501).
R (c)De-energize the Inertial Reference System (IRS) (Ref. 34-25-00, P. Block 501).
R (d)De-energize the Flight Management Computer (FMC) (Ref. 34-68-34, P. Block 501).
R (e)De-energize the Flight Environment Data (Ref. 34-10-00, P. Block 501).
R (f)De-energize the Passenger Entertainment (video) (Ref. 23-36-00, P. Block 501).
R (g)De-energize the aircraft electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).
R (h)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

## AIRSHOW CONTROL UNIT - REMOVAL/INSTALLATION

### 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Blanking Plugs/Caps |
| B. | Circuit Breaker Safety Clips |
| Referenced Procedure<br>- 23-37-00, P. Block 501 | Passenger Info/Airshow |

### 2. Procedure

(Ref. Fig. 401)

A. Job Set-Up

(1)Open, safety and tag the following circuit breaker for Airshow system:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | AIRSHOW | 190MM | D 5 |

(2)Get access to the video control center.

B. Removal

(1)Remove the screws which secure the ACU to the mounting bracket.
(2)Pull the ACU forward to get access to the electrical connector.
(3)Disconnect the electrical connector from the ACU.
(4)Remove the ACU from the mounting bracket.
(5)Install blanking caps and plugs to the disconnected electrical connectors.

C. Installation

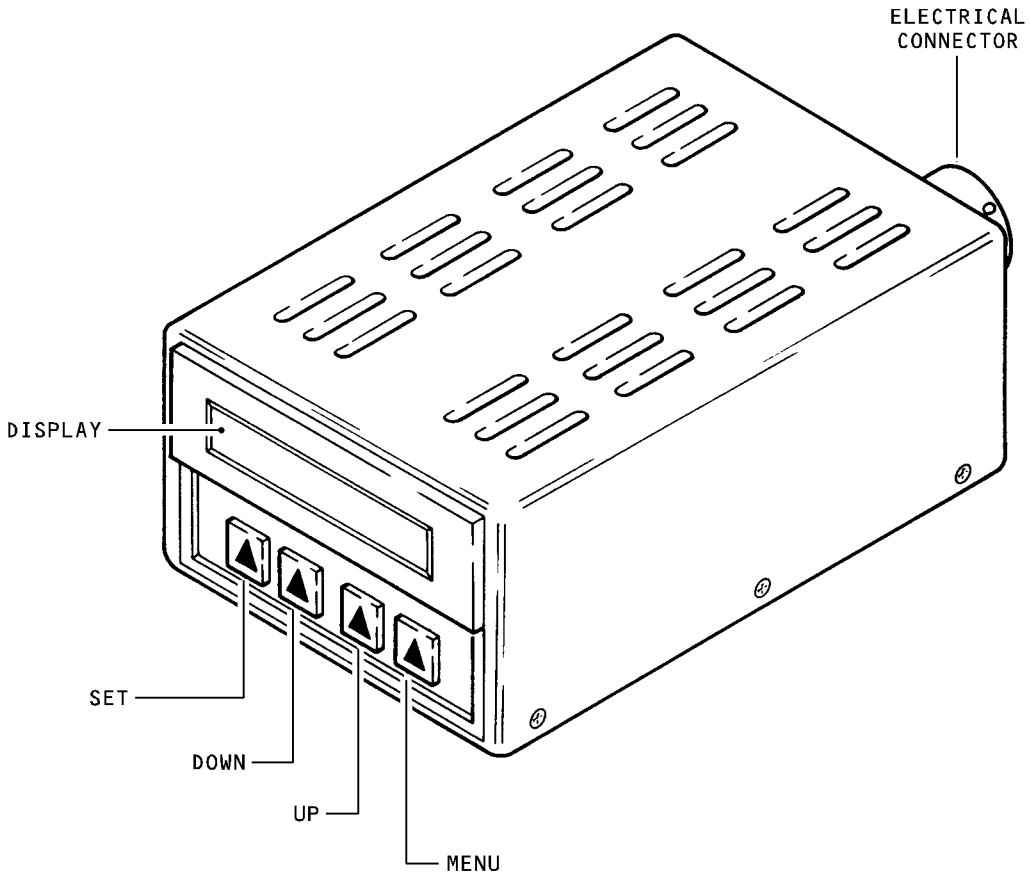
(1)Remove the blanking caps and plugs from electrical connectors.
(2)Put the ACU in the installed position.
(3)Connect the electrical connector to the ACU.
(4)Install the mounting screws that hold the ACU.
(5)Remove safety clip and tag and close circuit breaker 190MM.

D. Test

Carry out operational test of Airshow system (Ref. 23-37-00, P. Block 501).

E. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Restore system and aircraft to normal operating condition.




BM6 23 37 11 4 AADD 00

Airshow Control Unit
Figure 401

## 1. General

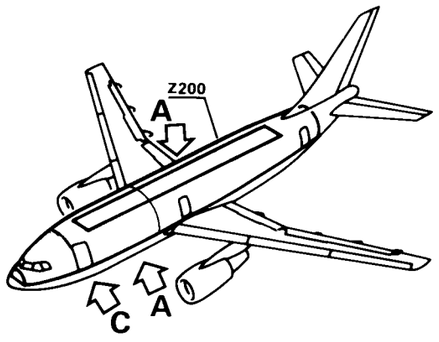
The Passenger Service System is designed to provide remote control for reading and steward call lights via the Passenger Control Units in the passenger compartment.
The lights are installed above each passenger seat on ceiling panels.
Additionally a chime via the passenger address amplifier over the cabin loudspeakers is heard when a call is initiated.
The PSS is also designed to provide test functions for all reading and steward call lights which can be controlled by BITE panel, fitted behind cover at purser station.

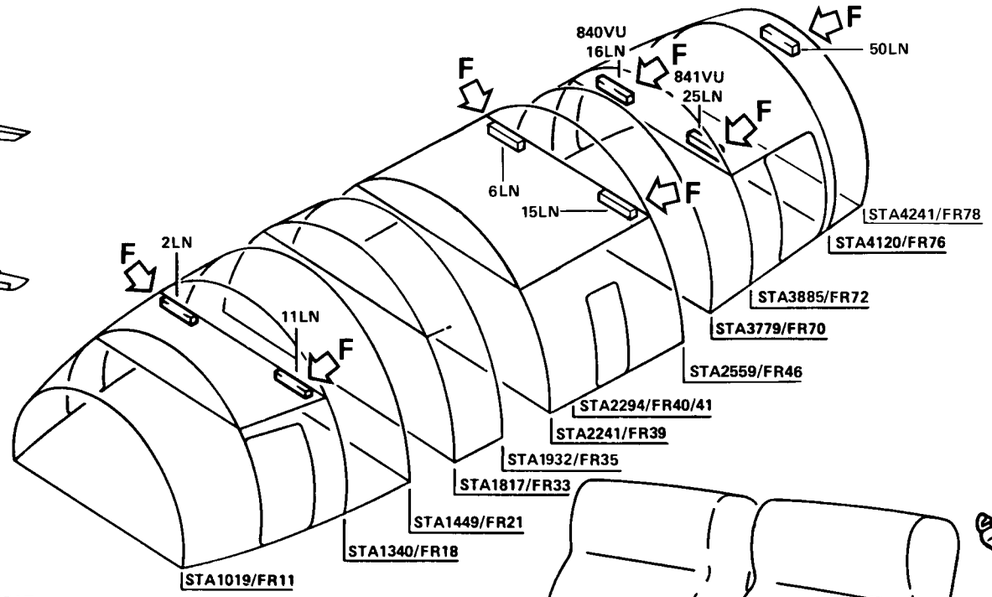
## 2. Component Location

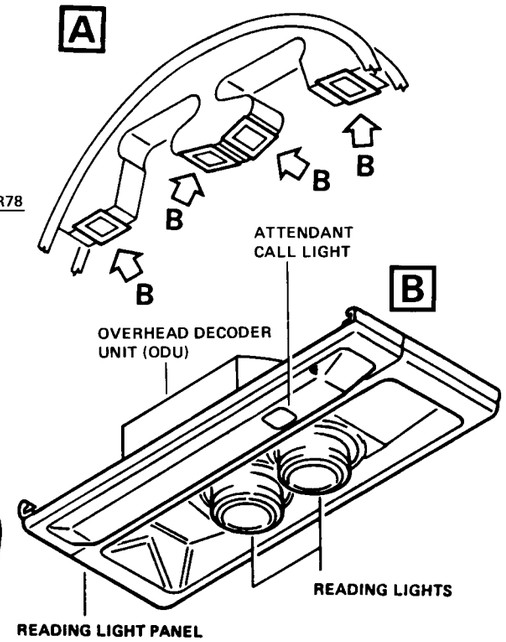
(Ref. Fig. 001)

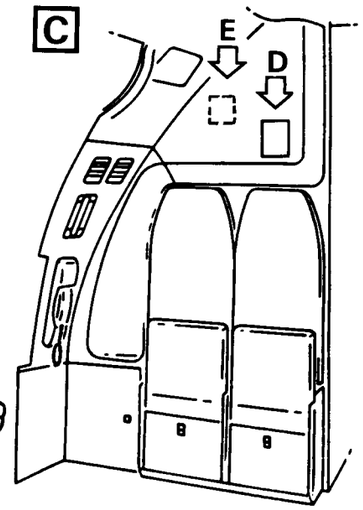
| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 30MN | READING LIGHT | 1354VU | 200 | | |
| 31MN | READING LIGHT | 1354VU | 200 | | |
| 33MN | INDICATOR LIGHT | 1354VU | 200 | | |
| 34MN | READING LIGHT | 1355VU | 200 | | |
| 35MN | READING LIGHT | 1355VU | 200 | | |
| 37MN | INDICATOR LIGHT | 1355VU | 200 | | |
| 39MN | READING LIGHT | 1342VU | 200 | | |
| 40MN | READING LIGHT | 1342VU | 200 | | |
| 42MN | INDICATOR LIGHT | 1342VU | 200 | | |
| 43MN | INDICATOR LIGHT | 1342VU | 200 | | |
| 44MN | READING LIGHT | 1342VU | 200 | | |
| 45MN | READING LIGHT | 1342VU | 200 | | |
| 110MN | OVERHEAD DECODER UNIT | 1354VU | 200 | | |
| 111MN | OVERHEAD DECODER UNIT | 1355VU | 200 | | |
| 112MN | OVERHEAD DECODER UNIT | 1342VU | 200 | | |
| 113MN | OVERHEAD DECODER UNIT | 1342VU | 200 | | |
| 2LN | AREA LIGHT PANEL | | 224 | | |
| 6LN | AREA LIGHT PANEL | | 234 | | |
| 11LN | AREA LIGHT PANEL | | 223 | | |
| 15LN | AREA LIGHT PANEL | | 233 | | |
| 16LN | AREA LIGHT PANEL | | 254 | | |
| 25LN | AREA LIGHT PANEL | | 253 | | |
| 50LN | AREA LIGHT PANEL | | 260 | | |
| 12MK | BITE PANEL | | 221 | | |
| 50MK | CONTROL UNIT-ZONE | | 100 | | |
| 51MK | MASTER ATTND PASS SERVICE PANEL | | 221 | | |
| 80MK | FLOOR DISCONNECT UNIT | | 100 | | |
| 100MK | SEAT ELECTRONIC BOX | | 200 | | |
| 200MK | PASSENGER CONTROL UNIT | | 200 | | |
| 201MK | PASSENGER CONTROL UNIT | | 200 | | |
| 202MK | PASSENGER CONTROL UNIT | | 200 | | |

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 203MK | PASSENGER CONTROL UNIT | | 200 | | |



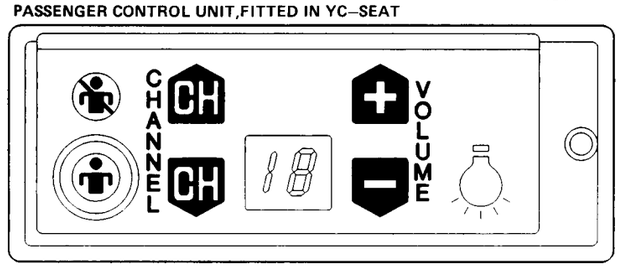



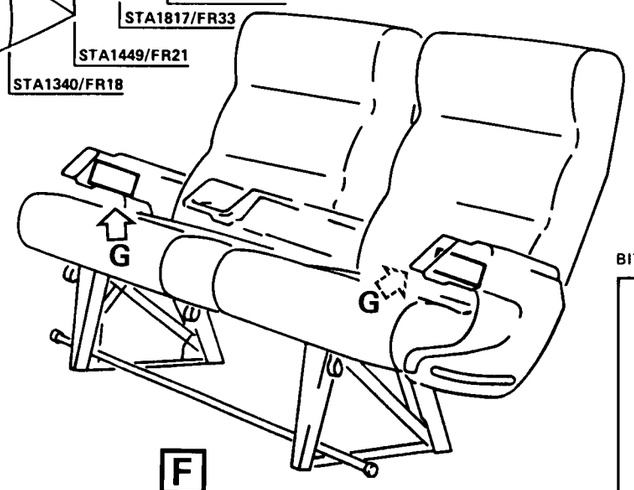




G

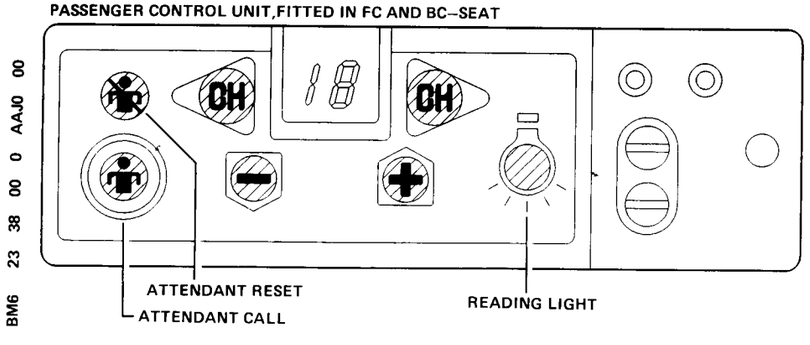
PASSENGER CONTROL UNIT,FITTED IN YC–SEAT



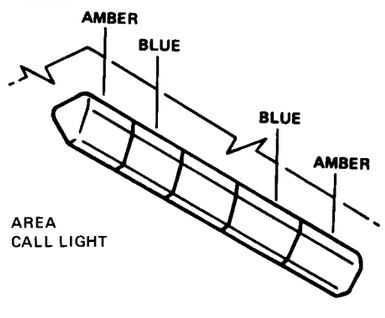




G

PASSENGER CONTROL UNIT,FITTED IN FC AND BC–SEAT



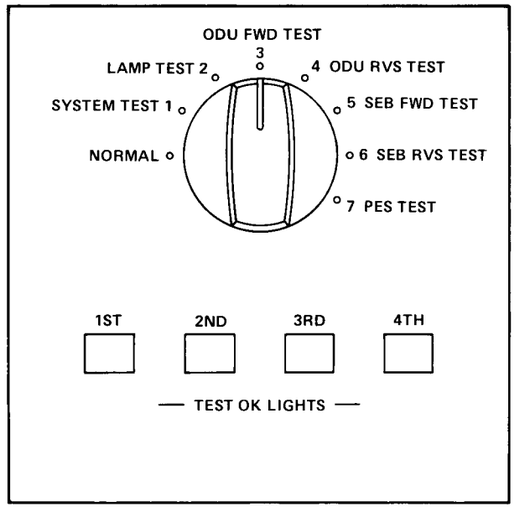

F




E

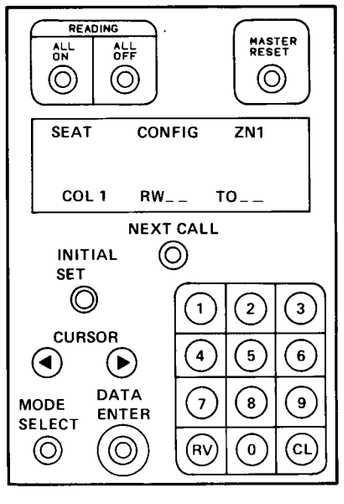
TYPICAL READING LIGHTS

BITE TEST UNIT 12MK




D

MASTER ATTENDANT PASSENGER
SERVICE PANEL 51MK




BM6 23 38 00 0 AAJ0 00

Passenger Service System - Component Location
Figure 001

3. System Description

A. In the FC, BC and YC passenger compartment a multiplexed passenger service system is installed to enable attendant calls to be made and reading lights to be switched from the PCUs in the seat armrests. The system components are supplied with power 115 V AC from busbar via circuit breaker in panel 800VU.
The system comprises:
- Master Attendant Passenger Service Panel (MAPSP), a component which can test the reading lights ON/OFF, reset all aircraft attendant calls, is able to control the entered passenger seat configurations and display the seat numbers of all passenger calls in the passenger compartment.
- BITE panel, a component which controls all TEST functions of PES/PSS.
- Zone Control Unit (ZCU), a component which will generate PSS timing for each row of seats in its respective zone. It receives commands and control data from the passenger control unit (PCU) via the seat electronic box (SEB) and processes them to the proper overhead and Attendant Passenger Service Unit.
- Overhead Decoder Unit (ODU), a component which supplies up to 3 reading lights and one call light.
- Passenger Control Unit (PCU), a component which enables to call up the attendant via the attendant call pushbutton, and to switch ON/OFF the passenger reading lights.
- Cable assemblies which interconnect and route control signals and power to and from the system components.
- Reading light and attendant call switches in the PCUs.

4. Component Description

A. Passenger Service Unit (PSU)
The PSU is a unit which contains an Overhead Decoder Unit, passenger reading lights and crew call light. The system is supplied from the 115 V AC busbar via the circuit breaker 1LW up to 12LW located on panel 800VU.

B. Overhead Decoder Unit (ODU)
The ODU is the interface of the PSS for the aircraft reading lights, attendant call lights, and attendant panel displays.
The device receives light control signals via the ZCU from PCU switches, or from the TEST switches (BITE panel, MAPSP) input. The ODU will respond to signals appearing on its data line to control the state of the reading and call lights.
The ODU receives the necessary power supply 115 V AC directly from CB panel 800VU and works within the ODU as follows:
- gives power to its internal logic circuits
- switches and drives up to three reading lights
- switches and drives one call light.

The ODU will have the capability to turn ON/OFF up to three reading lights and one call light in each seat group. Information pertaining to the required state of the lights appears at the ODU input connectors on a data bus originating at the ZCU. The ODU will decode the data and respond to commands to turn the lights ON or OFF.
When a call is initiated at a seat PCU, a momentary pulse turns via the

PCU- internal microprocessor via the Seat Electronic Box for encoding/decoding. An output signal transmitted to the Zone Control Unit via Floor Disconnect Box transmits a signal to the Master Attendant Passenger Service Panel (MAPSP).
The following will be indicated:
- call pushbutton on PCU illuminates
- seat and seat row number being called illuminate on MAPSP
- indicator light in the overhead panel over the seat pair being called comes on
- appropriate blue area call lights illuminate
- a HI-chime, generated in the 1RY PA amplifier, is heard over the FC, BC and YC passenger compartment ATTENDANT loudspeakers.

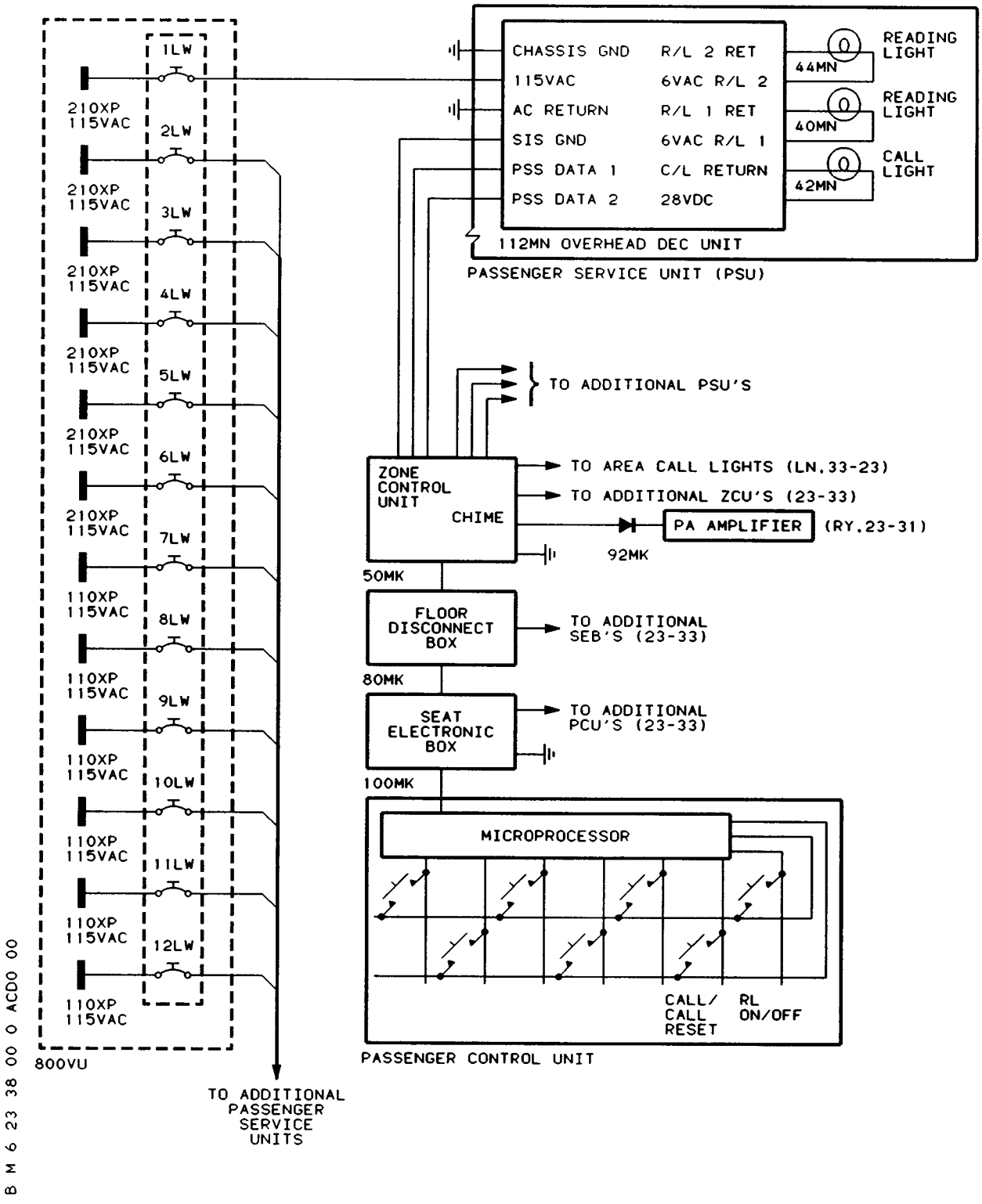
C. Passenger Control Unit (PCU)
The combined PES and PSS device contains PCUs with one pushbutton for reading light ON/OFF, and a pushbutton for attendant call and reset.

(Ref. Fig. 002)

5. Operation

A. With busbar 110XP and 210XP energized, 115 V AC power is supplied via the circuit breakers 1LW up to 12LW to the respective Overhead Decoder Units. Via the internally replaceable fuse the transformer steps down 115 V AC to 6 V AC for reading lights, and separately 28 V DC for call lights.
When a call from a PCU is initiated the following occurs:
- call pushbutton on PCU illuminates
- seat and seat row numbers being called illuminate on MAPSP
- call light in the respective ceiling panel comes on
- blue call light in the appropriate zone comes on
- a high chime is heard over the PA system at ATTENDANT loudspeakers
- when the call is cancelled all lights go off.

B. When the reading light pushbutton switch on PCU is pushed, the ODU is receiving commands from ZCU via data bus and feeds 6 V AC to reading lights. The reading lights illuminate.




Passenger Service Controller - Schematic
Figure 002

## PASSENGER SERVICES SYSTEM - ADJUSTMENT/TEST

### 1. Operational Test

A. Reason for the Job
(1)Built-In-Test-Equipment (BITE) Test
(2)Master Attendant Passenger Service Panel (MAPSP) Test
(3)Test of Passenger Compartment call system
(4)Test of FC, BC and YC Passenger Compartment reading lights

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |

Referenced Procedures

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 23-31-00, P. Block 501 | Passenger Address System |
| - 23-33-00, P. Block 501 | Passenger Entertainment (Music) |
| - 33-23-00, P. Block 501 | Call System |

C. Procedure
(1)Job Set-Up
(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | COM PASSENGER ADDRESS | 5RY | B15 |
| 800VU | CALL SYSTEM TEST | 4LN | E12 |
| 800VU | CALL SYSTEM TEST | 5LN | E11 |
| 800VU | PES/PSS | 20MK | D 1 |
| 800VU | PES/PSS | 21MK | D 2 |
| 800VU | PES/PSS | 22MK | D 3 |
| 800VU | READING LIGHT PASSENGER | 1LW | C 1 |
| 800VU | READING LIGHT PASSENGER | 2LW | C 2 |
| 800VU | READING LIGHT PASSENGER | 3LW | C 3 |
| 800VU | READING LIGHT PASSENGER | 4LW | C 4 |
| 800VU | READING LIGHT PASSENGER | 5LW | C 5 |
| 800VU | READING LIGHT PASSENGER | 6LW | C 6 |
| 800VU | READING LIGHT PASSENGER | 7LW | C 7 |
| 800VU | READING LIGHT PASSENGER | 8LW | C 8 |
| 800VU | READING LIGHT PASSENGER | 9LW | C 9 |
| 800VU | READING LIGHT PASSENGER | 10LW | C10 |
| 800VU | READING LIGHT PASSENGER | 11LW | C11 |
| 800VU | READING LIGHT PASSENGER | 12LW | C12 |

(2)Test
(a)Built-In Test Equipment (BITE)
NOTE : Make certain that the selection switch on BITE panel 12MK, which is behind a cover on purser station, is in position 'NORMAL'.

| ACTION | RESULT |
|---|---|
| 1. On BITE panel 12MK:<br>- turn selection switch to position 1 (SYSTEM TEST) | On BITE panel 12MK:<br>- After TEST loop is completed, TEST OK LIGHTS illuminate<br>- when test is completed a high chime is heard over all loud-speakers |
| 2. On BITE panel 12MK:<br>- turn selection switch to position 2 (LAMP TEST) | FC, BC and YC Passenger Compartment:<br>- after several seconds:<br>- all reading lights illuminate<br>- all call lights illuminate<br>- in all area light panels two blue and two amber lights come on<br>- outside each lavatory a yellow call light comes on<br>- a high chime is heard over all loudspeakers<br>On BITE panel 12MK:<br>- TEST OK LIGHTS illuminate |
| - return selection switch to position NORMAL | - all lights in (2) (a) 2. go off |
| 3. On BITE panel 12MK:<br>- turn selection switch to position 3 (ODU FWD TEST) | FC, BC and YC Passenger Compartment:<br>- all call lights illuminate from first to last seat row sequenti-ally and remain on<br>On BITE panel 12MK:<br>- TEST OK LIGHTS illuminate |
| 4. On BITE panel 12MK:<br>- turn selection switch to position 4 (ODU RVS TEST) | FC, BC and YC Passenger Compartment:<br>- all call lights illuminate at the same time, and then, all call lights sequentially go 'off' from last to first seat row<br>On BITE panel 12MK:<br>- TEST OK LIGHTS illuminate |
| - return selection switch to position NORMAL | - all lights in (2) (a) 4. go off |

(b)Master Attendant Passenger Service Panel (MAPSP).
NOTE : The following tests must not be executed before section (2)(a)Built-In Test Equipment (BITE) has been completed successfully.

NOTE : Make certain that the selection switch on BITE panel 12MK, which is behind a cover on purser station, is in position

'NORMAL'.

| ACTION | RESULT |
|---|---|
| In FC Passenger Compartment FWD:<br>1. Press call pushbutton on PCU in LH lateral seat pair | In FC Passenger Compartment FWD:<br>- call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP (purser station) illuminate<br>- in area light panel LH, AFT of FWD DOOR (11LN), the left blue light comes on<br>- In area light panel LH adjacent to EMER EXIT (15LN), the left blue light comes on<br>- in area light panel LH, FWD of AFT DOOR (25LN), the left blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the left blue light comes on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- A HI chime is heard over all atten-dants loudspeaker |
| 2. Press MASTER RESET pushbutton on MAPSP | - lights in (b) 1. go off |
| 3. Press call pushbuttons on PCU in LH center seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP illuminates<br>- in area light panel LH, AFT of FWD DOOR (11LN), the right blue light comes on<br>- in area light panel RH, AFT of FWD DOOR (2LN), the left blue light comes on<br>- in area light panel LH adjacent to EMERGENCY EXIT (15LN), the right blue light comes on<br>- in area light panel RH adjacent to EMERGENCY EXIT (6LN), the left blue light comes on<br>- in area light panel LH, FWD of AFT DOOR (25LN), the right blue light comes on<br>- in area light panel RH, FWD of AFT DOOR (16LN), the left blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the left and right blue lights come on<br>- the indicator light in the over- |

| ACTION | RESULT |
|---|---|
| | head panel over the seat pair being tested comes on<br>- **A HI** chime is heard over all attendants loudspeaker |
| 4. Press **MASTER RESET** pushbutton on **MAPSP** | - lights in (b) **3.** go off |
| 5. Press call pushbutton on **PCU** in **RH** center seat pair | - call pushbutton on **PCU** illuminates<br>- seat and seat row numbers on **MAPSP** illuminate<br>- in area light panel **RH, AFT** of **FWD DOOR (2LN),** the left blue light comes on<br>- in area light panel **LH, AFT** of **FWD DOOR (11LN),** the right blue light comes on<br>- In area light panel **RH** adjacent to **EMER EXIT (6LN),** the left blue light comes on<br>- In area light panel **LH** adjacent to **EMER EXIT (15LN),** the right blue light comes on<br>- in area light panel **RH, FWD** of **AFT DOOR (16LN),** the left blue light comes on<br>- in area light panel **LH, FWD** of **AFT DOOR (25LN),** the right blue light comes on<br>- in area light panel located between **AFT GALLEYs (50LN),** the right and left blue lights come on<br>- the indicator light in the overhead panel over the seat pair being tested comes on<br>- **A HI** chime is heard over all attendants loudspeaker |
| 6. Press **MASTER RESET** pushbutton on **MAPSP** | - lights in (b) **5.** go off |
| 7. Press call pushbuttons on **PCU** in **RH** lateral seat pair | - call pushbutton on **PCU** illuminates<br>- seat and seat row numbers on **MAPSP** illuminate<br>- in area light panel **RH, AFT** of **FWD DOOR (2LN),** the right blue light comes on<br>- In area light panel **RH** adjacent to **EMER EXIT (6LN),** the right blue light comes on<br>- in area light panel **RH, FWD** of **AFT DOOR (16LN),** the right blue light comes on |

| ACTION | RESULT |
|---|---|
| | - in area light panel located between AFT GALLEYs (50LN), the right blue light comes on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- A HI chime is heard over all atten-dants loudspeaker |
| 8. Press MASTER RESET pushbutton on MAPSP | - lights in (b) 7. go off |
| In BC Passenger Compartment: | In BC Passenger Compartment: |
| 9. Press call pushbutton on PCU in LH lateral seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP (purser station) illuminate<br>- in area light panel LH, AFT of FWD DOOR (11LN), the left blue light comes on<br>- In area light panel LH adjacent to EMER EXIT (15LN), the left blue light comes on<br>- in area light panel LH, FWD of AFT DOOR (25LN), the left blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the left blue light comes on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- A HI chime is heard over all atten-dants loudspeaker |
| 10. Press MASTER RESET pushbutton on MAPSP | - lights in (b) 9. go off |
| 11. Press call pushbutton on PCU in LH center seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP illuminate<br>- in area light panel LH, AFT of FWD DOOR (11LN), the right blue light comes on<br>- in area light panel RH, AFT of FWD DOOR (2LN), the left blue light comes on<br>- in area light panel LH adjacent to EMERGENCY EXIT (15LN), the right blue light comes on<br>- in area light panel RH adjacent to EMERGENCY EXIT (6LN), the left blue light comes on<br>- in area light panel LH, FWD of AFT |

| ACTION | RESULT |
|---|---|
| | DOOR (25LN), the right blue light comes on<br>- in area light panel RH, FWD of AFT DOOR (16LN), the left blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the left and right blue lights come on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- A HI chime is heard over all atten-dants loudspeaker |
| 12. Press MASTER RESET pushbutton on MAPSP | - lights in (b) 11. go off |
| 13. Press call pushbutton on PCU in RH center seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP illuminate<br>- in area light panel RH, AFT of FWD DOOR (2LN), the left blue light comes on<br>- in area light panel LH, AFT of FWD DOOR (11LN), the right blue light comes on<br>- In area light panel RH adjacent to EMER EXIT (6LN), the left blue light comes on<br>- In area light panel LH adjacent to EMER EXIT (15LN), the right blue light comes on<br>- in area light panel RH, FWD of AFT DOOR (16LN), the left blue light comes on<br>- in area light panel LH, FWD of AFT DOOR (25LN), the right blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the right and left blue lights come on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- A HI chime is heard over all atten-dants loudspeaker |
| 14. Press MASTER RESET pushbutton on MAPSP | - lights in (b) 13. go off |
| 15. Press call pushbutton on PCU in RH lateral seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP illuminate |

| ACTION | RESULT |
|---|---|
| | - in area light panel RH, AFT of FWD DOOR (2LN), the right blue light comes on<br>- In area light panel RH adjacent to EMER EXIT (6LN), the right blue light comes on<br>- in area light panel RH, FWD of AFT DOOR (16LN), the right blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the right blue light comes on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- A HI chime is heard over all atten-dants loudspeaker |
| 16. Press MASTER RESET pushbutton on MAPSP | - lights in (b) 15. go off |
| In YC Passenger Compartment: | In YC Passenger Compartment: |
| 17. Press call pushbutton on PCU in LH lateral seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP (purser station) illuminate<br>- in area light panel LH, AFT of FWD DOOR (11LN), the left blue light comes on<br>- In area light panel LH adjacent to EMER EXIT (15LN), the left blue light comes on<br>- in area light panel LH, FWD of AFT DOOR (25LN), the left blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the left blue light comes on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- A HI chime is heard over all atten-dants loudspeaker |
| 18. Press MASTER RESET pushbutton on MAPSP | - lights in (b) 17. go off |
| 19. Press call pushbuttons on PCU in LH center seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP illuminate<br>- in area light panel LH, AFT of FWD DOOR (11LN), the right blue light comes on<br>- in area light panel RH, AFT of FWD |

| ACTION | RESULT |
|---|---|
| | DOOR (2LN), the left blue light comes on<br>- in area light panel LH adjacent to EMERGENCY EXIT (15LN), the right blue light comes on<br>- in area light panel RH adjacent to EMERGENCY EXIT (6LN), the left blue light comes on<br>- in area light panel LH, FWD of AFT DOOR (25LN), the right blue light comes on<br>- in area light panel RH, FWD of AFT DOOR (16LN), the left blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the left and right blue lights come on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- A HI chime is heard over all atten-dants loudspeaker |
| 20. Press MASTER RESET pushbutton on MAPSP | - lights in (b) 19. go off |
| 21. Press call pushbutton on PCU in RH center seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP illuminate<br>- in area light panel RH, AFT of FWD DOOR (2LN), the left blue light comes on<br>- in area light panel LH, AFT of FWD DOOR (11LN), the right blue light comes on<br>- In area light panel RH adjacent to EMER EXIT (6LN), the left blue light comes on<br>- In area light panel LH adjacent to EMER EXIT (15LN), the right blue light comes on<br>- in area light panel RH, FWD of AFT DOOR (16LN), the left blue light comes on<br>- in area light panel LH, FWD of AFT DOOR (25LN), the right blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the right and left blue lights come on<br>- the indicator light in the over- |

| ACTION | RESULT |
|---|---|
| | head panel over the seat pair being tested comes on<br>- **A HI** chime is heard over all attendants loudspeaker |
| 22. Press **MASTER RESET** pushbutton on **MAPSP** | - lights in (b) 21. go off |
| 23. Press call pushbutton on **PCU** in **RH** lateral seat pair | - call pushbutton on **PCU** illuminates<br>- seat and seat row numbers on **MAPSP** illuminate<br>- in area light panel **RH, AFT** of **FWD DOOR (2LN),** the right blue light comes on<br>- In area light panel **RH** adjacent to **EMER EXIT (6LN),** the right blue light comes on<br>- in area light panel **RH, FWD** of **AFT DOOR (16LN),** the right blue light comes on<br>- in area light panel located between **AFT GALLEYs (50LN),** the right blue light comes on<br>- the indicator light in the overhead panel over the seat pair being tested comes on<br>- **A HI** chime is heard over all attendants loudspeaker |
| 24. Press **MASTER RESET** pushbutton on **MAPSP** | - lights in (b) 23. go off |
| 25. Press 5 random passenger call pushbuttons on **PCUs** in **FC, BC** and **YC** passenger compartment | Following lights illuminate:<br>- **PCU's**- call buttons being pushed<br>- respective call lights<br>- respective blue area call light<br>On **MAPSP 51MK:**<br>- first selected seat and seat row is displayed<br>- **LED** of **NEXT CALL** pushbutton is displayed after second passenger call |
| On **MAPSP 51MK:**<br>-press pushbutton **NEXT CALL** | - second calling seat and seat row number is displayed<br>- next calling seat numbers can be displayed one by one by pushing the **NEXT CALL** pushbutton |
| 26. Press **MASTER RESET** pushbutton on **MAPSP** | - lights in (b) 25. go off |
| 27. On **MAPSP 51MK:**<br>Press **READING ALL ON** pushbutton | On **MAPSP 51MK:**<br>After several seconds:<br>- all reading lights illuminate |
| 28. On **MAPSP 51MK:** | On **MAPSP 51MK:** |

| ACTION | RESULT |
|---|---|
| Press **READING ALL OFF** pushbutton | After several seconds:<br>- all reading lights go off |

(c) Test of Passenger Call System

NOTE : Make certain that the selection switch on **BITE** panel **12MK**, which is behind a cover on purser station, is in position **'NORMAL'**.

| ACTION | RESULT |
|---|---|
| In **FC** Passenger Compartment **FWD**: | In **FC** Passenger Compartment **FWD**: |
| 1. Press call pushbutton on **PCU** in **LH** lateral seat pair | - call pushbutton on **PCU** illuminates<br>- seat and seat row numbers on **MAPSP** (purser station) illuminate<br>- in area light panel **LH**, **AFT** of **FWD DOOR (11LN)**, the left blue light comes on<br>- In area light panel **LH** adjacent to **EMER EXIT (15LN)**, the left blue light comes on<br>- in area light panel **LH**, **FWD** of **AFT DOOR (25LN)**, the left blue light comes on<br>- in area light panel located between **AFT GALLEYs (50LN)**, the left blue light comes on<br>- the indicator light in the overhead panel over the seat pair being tested comes on<br>- **A HI** chime is heard over all attendants loudspeaker |
| 2. Press **RESET** pushbutton on **PCU** in **LH** lateral seat pair | - lights in (c) 1. go off |
| 3. Press call pushbuttons on **PCU** in **LH** center seat pair | - call pushbutton on **PCU** illuminates<br>- seat and seat row numbers on **MAPSP** illuminates<br>- in area light panel **LH**, **AFT** of **FWD DOOR (11LN)**, the right blue light comes on<br>- in area light panel **RH**, **AFT** of **FWD DOOR (2LN)**, the left blue light comes on<br>- in area light panel **LH** adjacent to **EMERGENCY EXIT (15LN)**, the right blue light comes on<br>- in area light panel **RH** adjacent to **EMERGENCY EXIT (6LN)**, the left blue light comes on<br>- in area light panel **LH**, **FWD** of **AFT** |

| ACTION | RESULT |
|---|---|
| | DOOR (25LN), the right blue light comes on<br>- in area light panel RH, FWD of AFT DOOR (16LN), the left blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the left and right blue lights come on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- A HI chime is heard over all atten-dants loudspeaker |
| 4. Press RESET pushbutton on PCU in LH center seat pair | - lights in (c) 3. go off |
| 5. Press call pushbutton on PCU in RH center seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP illuminate<br>- in area light panel RH, AFT of FWD DOOR (2LN), the left blue light comes on<br>- in area light panel LH, AFT of FWD DOOR (11LN), the right blue light comes on<br>- In area light panel RH adjacent to EMER EXIT (6LN), the left blue light comes on<br>- In area light panel LH adjacent to EMER EXIT (15LN), the right blue light comes on<br>- in area light panel RH, FWD of AFT DOOR (16LN), the left blue light comes on<br>- in area light panel LH, FWD of AFT DOOR (25LN), the right blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the right and left blue lights come on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- A HI chime is heard over all atten-dants loudspeaker |
| 6. Press RESET pushbutton on PCU in RH center seat pair | - lights in (c) 5. go off |
| 7. Press call pushbuttons on PCU in RH lateral seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP illuminate |

| ACTION | RESULT |
|---|---|
| | - in area light panel **RH, AFT** of **FWD DOOR (2LN),** the right blue light comes on<br>- In area light panel **RH** adjacent to **EMER EXIT (6LN),** the right blue light comes on<br>- in area light panel **RH, FWD** of **AFT DOOR (16LN),** the right blue light comes on<br>- in area light panel located between **AFT GALLEYs (50LN),** the right blue light comes on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- **A HI** chime is heard over all atten-dants loudspeaker |
| 8. Press **RESET** pushbutton on **PCU** in **RH** lateral seat pair | - lights in (c) 7. go off |
| In **BC** Passenger Compartment: | In **BC** Passenger Compartment: |
| 9. Press call pushbutton on **PCU** in LH lateral seat pair | - call pushbutton on **PCU** illuminates<br>- seat and seat row numbers on **MAPSP** (purser station) illuminate<br>- in area light panel **LH, AFT** of **FWD DOOR (11LN),** the left blue light comes on<br>- In area light panel **LH** adjacent to **EMER EXIT (15LN),** the left blue light comes on<br>- in area light panel **LH, FWD** of **AFT DOOR (25LN),** the left blue light comes on<br>- in area light panel located between **AFT GALLEYs (50LN),** the left blue light comes on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- **A HI** chime is heard over all atten-dants loudspeaker |
| 10. Press **RESET** pushbutton on **PCU** in lateral seat pair | - lights in (c) 9. go off |
| 11. Press call pushbutton on **PCU** in LH center seat pair | - call pushbutton on **PCU** illuminates<br>- seat and seat row numbers on **MAPSP** illuminate<br>- in area light panel **LH, AFT** of **FWD DOOR (11LN),** the right blue light comes on<br>- in area light panel **RH, AFT** of **FWD** |

| ACTION | RESULT |
|---|---|
| | DOOR (2LN), the left blue light comes on<br>- in area light panel LH adjacent to EMERGENCY EXIT (15LN), the right blue light comes on<br>- in area light panel RH adjacent to EMERGENCY EXIT (6LN), the left blue light comes on<br>- in area light panel LH, FWD of AFT DOOR (25LN), the right blue light comes on<br>- in area light panel RH, FWD of AFT DOOR (16LN), the left blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the left and right blue lights come on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- A HI chime is heard over all atten-dants loudspeaker |
| 12. Press RESET pushbutton on PCU in LH center seat pair | - lights in (c) 11. go off |
| 13. Press call pushbutton on PCU in RH center seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP illuminate<br>- in area light panel RH, AFT of FWD DOOR (2LN), the left blue light comes on<br>- in area light panel LH, AFT of FWD DOOR (11LN), the right blue light comes on<br>- In area light panel RH adjacent to EMER EXIT (6LN), the left blue light comes on<br>- In area light panel LH adjacent to EMER EXIT (15LN), the right blue light comes on<br>- in area light panel RH, FWD of AFT DOOR (16LN), the left blue light comes on<br>- in area light panel LH, FWD of AFT DOOR (25LN), the right blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the right and left blue lights come on<br>- the indicator light in the over- |

| ACTION | RESULT |
|---|---|
| | head panel over the seat pair being tested comes on<br>- **A HI** chime is heard over all attendants loudspeaker |
| 14. Press **RESET** pushbutton on **PCU** in **RH** center seat pair | - lights in (c) **13.** go off |
| 15. Press call pushbutton on **PCU** in **RH** lateral seat pair | - call pushbutton on **PCU** illuminates<br>- seat and seat row numbers on **MAPSP** illuminate<br>- in area light panel **RH, AFT** of **FWD DOOR (2LN),** the right blue light comes on<br>- In area light panel **RH** adjacent to **EMER EXIT (6LN),** the right blue light comes on<br>- in area light panel **RH, FWD** of **AFT DOOR (16LN),** the right blue light comes on<br>- in area light panel located between **AFT GALLEYs (50LN),** the right blue light comes on<br>- the indicator light in the overhead panel over the seat pair being tested comes on<br>- **A HI** chime is heard over all attendants loudspeaker |
| 16. Press **RESET** pushbutton on **PCU** in **RH** lateral seat pair | - lights in (c) **15.** go off |
| In YC Passenger Compartment: | In YC Passenger Compartment: |
| 17. Press call pushbutton on **PCU** in **LH** lateral seat pair | - call pushbutton on **PCU** illuminates<br>- seat and seat row numbers on **MAPSP** (purser station) illuminate<br>- in area light panel **LH, AFT** of **FWD DOOR (11LN),** the left blue light comes on<br>- In area light panel **LH** adjacent to **EMER EXIT (15LN),** the left blue light comes on<br>- in area light panel **LH, FWD** of **AFT DOOR (25LN),** the left blue light comes on<br>- in area light panel located between **AFT GALLEYs (50LN),** the left blue light comes on<br>- the indicator light in the overhead panel over the seat pair being tested comes on<br>- **A HI** chime is heard over all attendants loudspeaker |

| ACTION | RESULT |
|---|---|
| 18. Press RESET pushbutton on PCU in LH lateral seat pair | - lights in (c) 17. go off |
| 19. Press call pushbuttons on PCU in LH center seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP illuminate<br>- in area light panel LH, AFT of FWD DOOR (11LN), the right blue light comes on<br>- in area light panel RH, AFT of FWD DOOR (2LN), the left blue light comes on<br>- in area light panel LH adjacent to EMERGENCY EXIT (15LN), the right blue light comes on<br>- in area light panel RH adjacent to EMERGENCY EXIT (6LN), the left blue light comes on<br>- in area light panel LH, FWD of AFT DOOR (25LN), the right blue light comes on<br>- in area light panel RH, FWD of AFT DOOR (16LN), the left blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the left and right blue lights come on<br>- the indicator light in the over-head panel over the seat pair being tested comes on<br>- A HI chime is heard over all atten-dants loudspeaker |
| 20. Press RESET pushbutton on PCU in LH center seat pair | - lights in (c) 19. go off |
| 21. Press call pushbutton on PCU in RH center seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP illuminate<br>- in area light panel RH, AFT of FWD DOOR (2LN), the left blue light comes on<br>- in area light panel LH, AFT of FWD DOOR (11LN), the right blue light comes on<br>- In area light panel RH adjacent to EMER EXIT (6LN), the left blue light comes on<br>- In area light panel LH adjacent to EMER EXIT (15LN), the right blue light comes on<br>- in area light panel RH, FWD of AFT |

| ACTION | RESULT |
|---|---|
| | DOOR (16LN), the left blue light comes on<br>- in area light panel LH, FWD of AFT DOOR (25LN), the right blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the right and left blue lights come on<br>- the indicator light in the overhead panel over the seat pair being tested comes on<br>- A HI chime is heard over all attendants loudspeaker |
| 22. Press RESET pushbutton on PCU in RH center seat pair | - lights in (c) 21. go off |
| 23. Press call pushbutton on PCU in RH lateral seat pair | - call pushbutton on PCU illuminates<br>- seat and seat row numbers on MAPSP illuminate<br>- in area light panel RH, AFT of FWD DOOR (2LN), the right blue light comes on<br>- In area light panel RH adjacent to EMER EXIT (6LN), the right blue light comes on<br>- in area light panel RH, FWD of AFT DOOR (16LN), the right blue light comes on<br>- in area light panel located between AFT GALLEYs (50LN), the right blue light comes on<br>- the indicator light in the overhead panel over the seat pair being tested comes on<br>- A HI chime is heard over all attendants loudspeaker |
| 24. Press RESET pushbutton on PCU in RH lateral seat pair | - lights in (c) 23. go off |

(d) Test of FC, BC and YC Passenger Compartment Reading Lights

NOTE : Make certain that the selection switch on BITE panel 12MK, which is behind a cover on purser station, is in position 'NORMAL'.

| ACTION | RESULT |
|---|---|
| At Purser Station: | In FC, BC and YC Passenger Compartment: |
| 1. On Master Attendant Passenger Service Panel (MAPSP) press READING ALL ON | - all reading lights illuminate |
| 2. On MAPSP (51MK) press READING ALL OFF | - lights in (d) 1. go off |

| ACTION | RESULT |
|---|---|
| On PCU in FC, BC and YC Passenger Compartment: | |
| 3. Press LIGHT pushbutton | - the reading light in the overhead panel over the seat being tested comes on |
| 4. Press LIGHT pushbutton again | - lights in (d) 3. go off |

(3)Close-Up

(a)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(b)De-energize electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| B. | Blanking Caps and Plugs |

Referenced Procedures

| | |
|---|---|
| - 23-38-00, P. Block 501 | Passenger Service System |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 25-25-00, P. Block 1 | Passenger Service Units |

## 2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 800VU | READING LIGHT PASSENGER | 1LW | C1 |
| 800VU | READING LIGHT PASSENGER | 2LW | C2 |
| 800VU | READING LIGHT PASSENGER | 3LW | C3 |
| 800VU | READING LIGHT PASSENGER | 4LW | C4 |
| 800VU | READING LIGHT PASSENGER | 5LW | C5 |
| 800VU | READING LIGHT PASSENGER | 6LW | C6 |
| 800VU | READING LIGHT PASSENGER | 7LW | C7 |
| 800VU | READING LIGHT PASSENGER | 8LW | C8 |
| 800VU | READING LIGHT PASSENGER | 9LW | C9 |
| 800VU | READING LIGHT PASSENGER | 10LW | C10 |
| 800VU | READING LIGHT PASSENGER | 11LW | C11 |
| 800VU | READING LIGHT PASSENGER | 12LW | C12 |
| 800VU | PES/PSS | 20MK | D1 |
| 800VU | PES/PSS | 20MK | D2 |
| 800VU | PES/PSS | 22MK | D3 |

(2)Disengage one side of the utility panel (Ref. 25-25-00, P. Block 1) and lower to the servicing position.

B. Removal

(1)Note the position of the electrical connectors. Disconnect the electrical connectors from the overhead decoder unit (ODU).

(2)Remove the screws (1), the serrated lock washers (2) and the flat washers (3).

(3)Fit blanking caps and plugs to the disconnected electrical connectors.

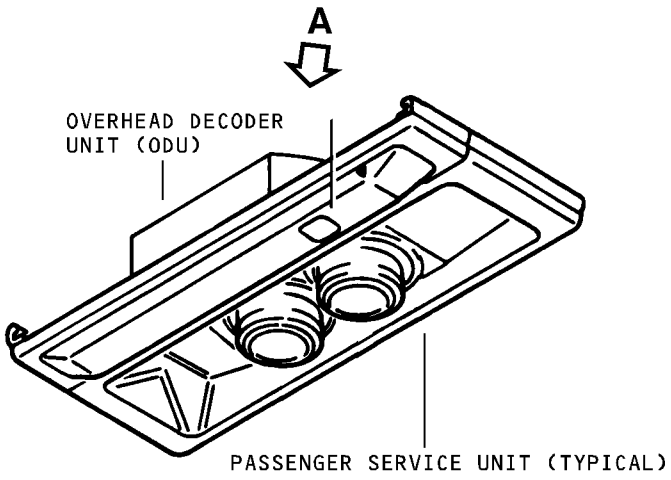
C. Installation

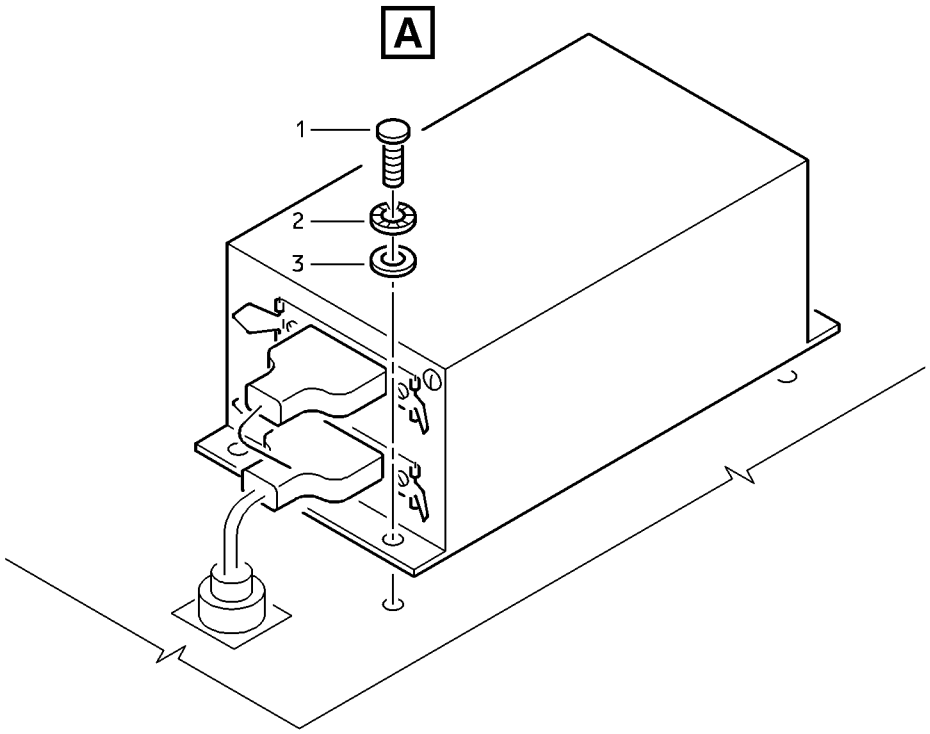
(1)Remove the blanking caps and plugs from the disconnected electrical connectors.

(2)Place the ODU in the installed position.
(3)Secure the ODU with the screws (1), the serrated lock washers (2) and the flat washers (3).
(4)Connect the electrical connectors in the positions noted in step 2. B. (1).
(Ref. Fig. 401)

D. Test
(1)Remove safety clips and tags and close the circuit breakers opened in step 2. A. (1).
(2)Do a BITE test of the passenger service system (Ref. 23-38-00, P. Block 501).

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Install the utility panel (Ref. 25-25-00, P. Block 1).
(3)De-energize aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).




BM6 23 38 11 4 AAA0 00

Overhead Decoder Unit
Figure 401

# FLIGHT INTERPHONE - DESCRIPTION AND OPERATION

## 1. General

The flight interphone system allows :
- telephone communications between the crew members
- telephone communications between the crew members and the ground mechanic from the ground power receptacle housing.

## 2. Component Location

(Ref. Fig. 001)

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 4RL | JACK - FLT INTPH | 108VU | 120 | 121EL | |
| 6RL | JACK - FULL FACE OXYGEN MASK | 296VU | 121 | 121BL | |
| 7RL | JACK - FULL FACE OXYGEN MASK | 296VU | 121 | 121BL | |
| 1RN | AUDIO INTERCOM UNIT | | 121 | 121BL | 23-51-18 |

## 3. System Description

The flight interphone installation comprises :
- An amplifier located inside the audio intercommunication unit
- A jack for connection of the ground service telephone
- Two jacks for connection of the full face oxygen mask and headset

In addition the flight interphone system is associated with the audio integrating system components (audio control panels, jack panels, acoustic equipment etc.) (23-50-00).

## 4. Electrical Power Supply

(Ref. Fig. 002)

The flight interphone system is supplied with 28VDC from ultimate emergency busbar 3PP by busbar 306PP via 3A circuit breaker 1RL located on circuit breaker panel 22VU (205).

## 5. Operation

R **ON A/C 001-100,

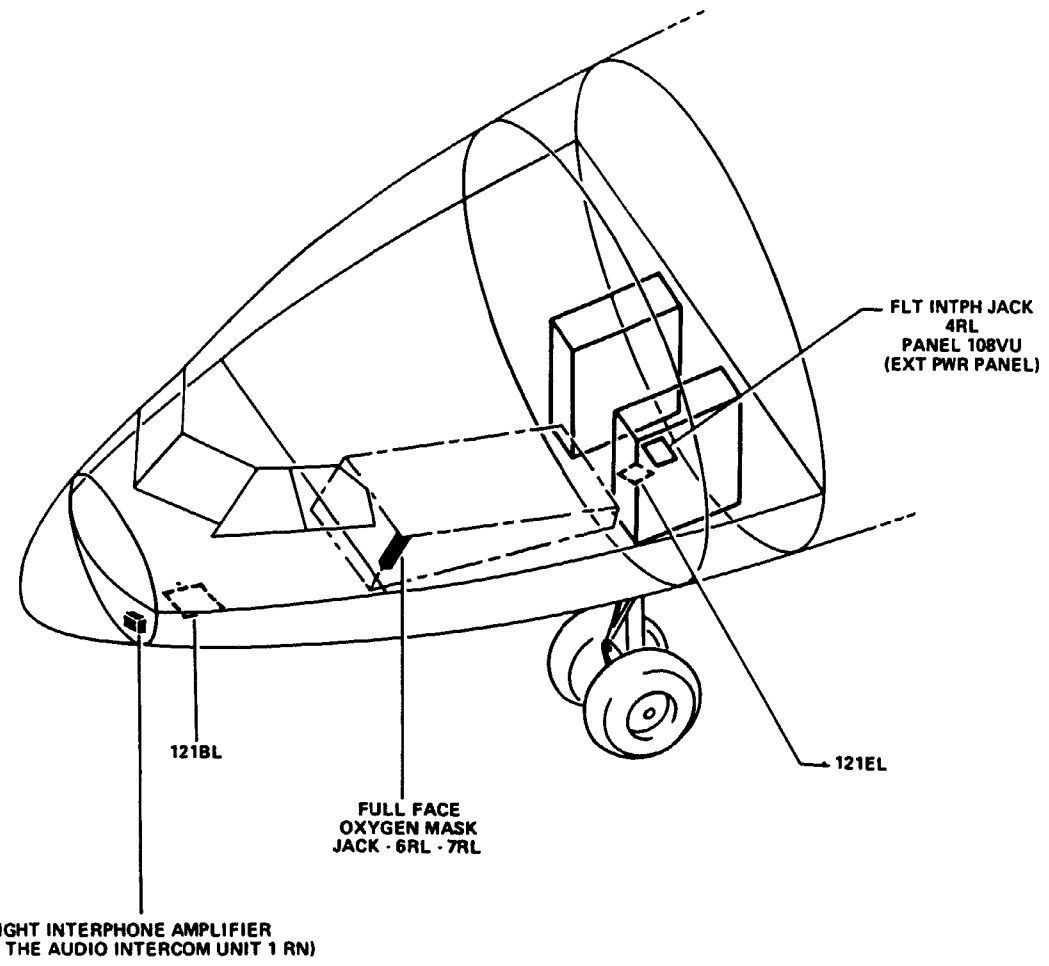
(Ref. Fig. 003)

R **ON A/C 101-200,

(Ref. Fig. 004)

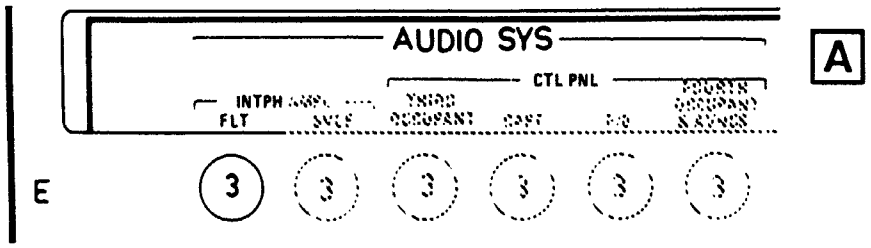
R **ON A/C 001-100,

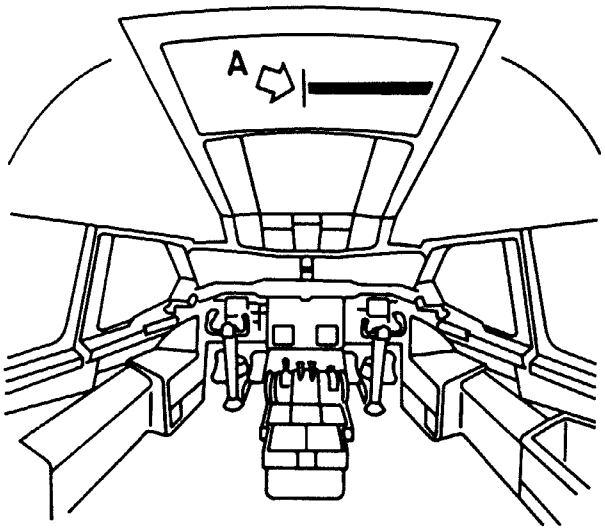
In flight interphone mode, the microphone signals from the Captain's, First Officer's, Third Occupant's stations and avionics compartment full face oxygen mask connection box and flight interphone jack in the ground power receptable housing are fed to the flight interphone amplifier on separate inputs.

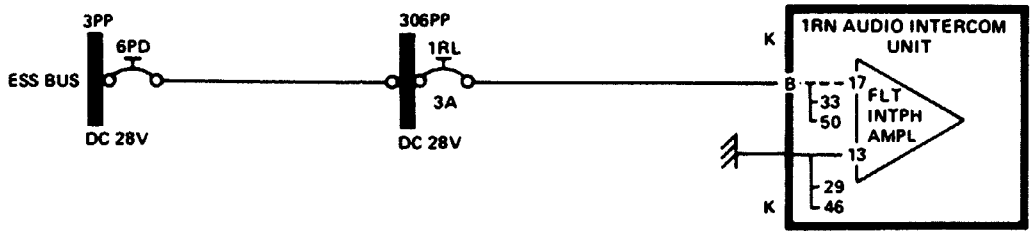



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Flight Interphone - Component Location
Figure 001

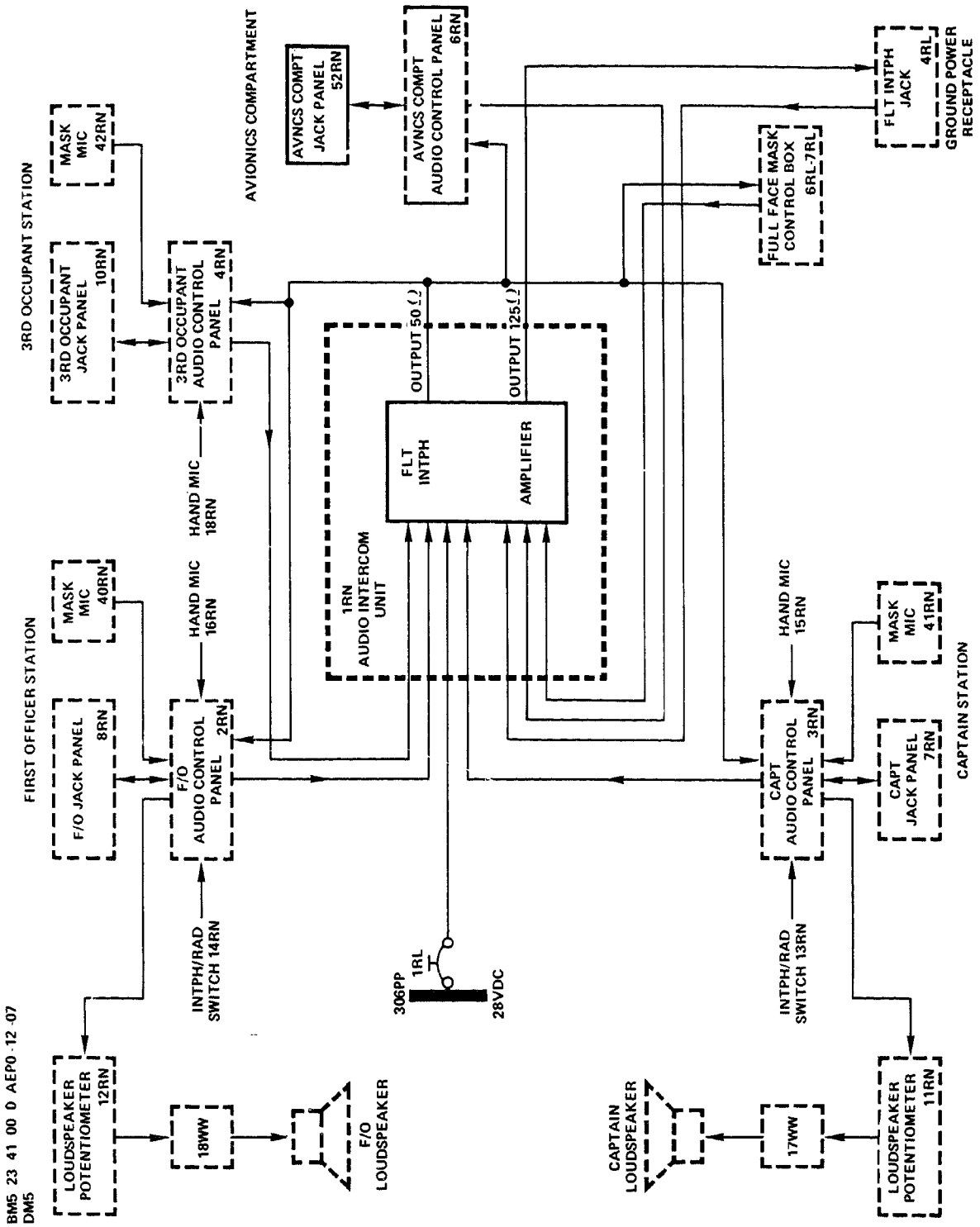


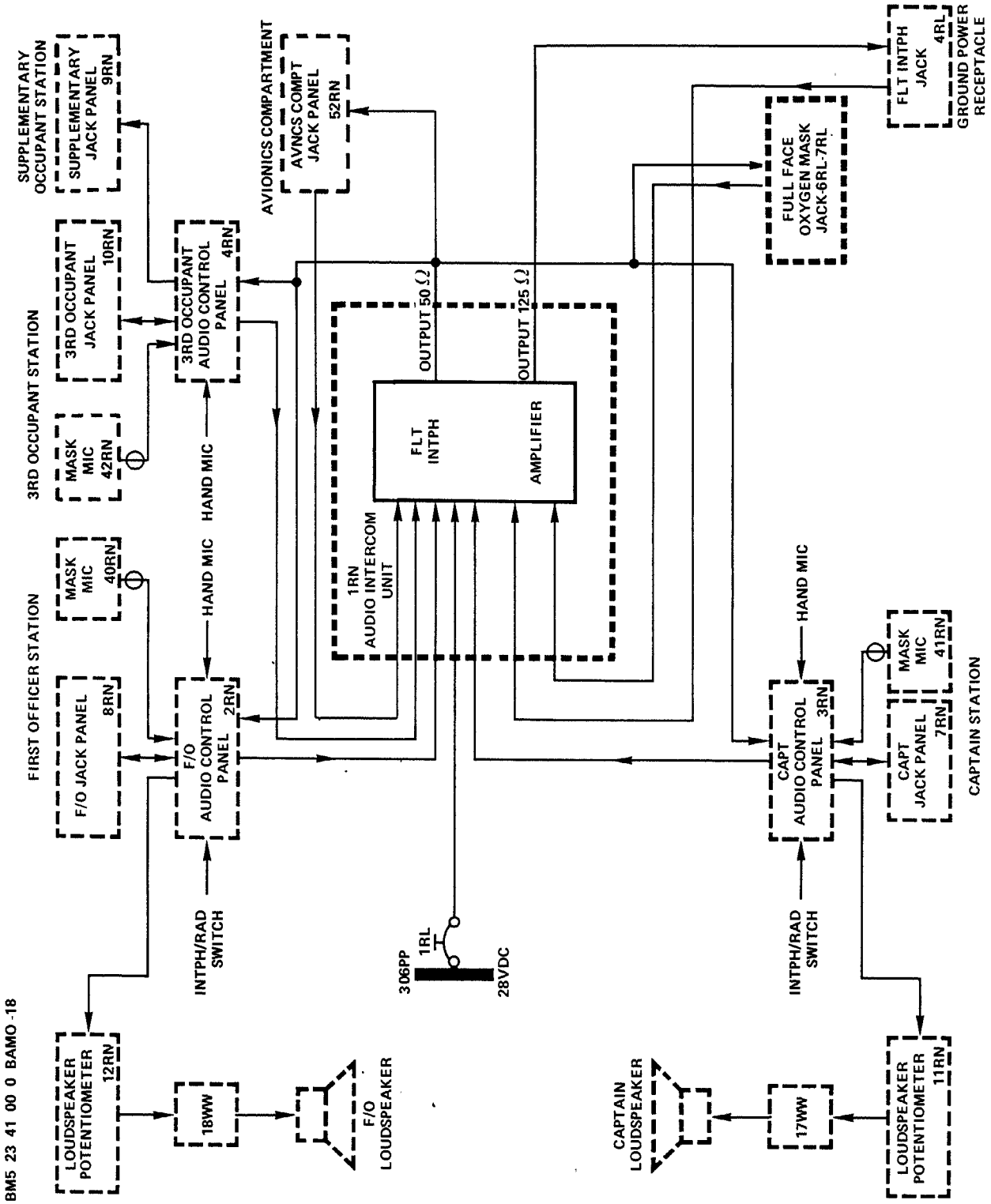




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DM5

Flight Interphone - Electrical Power Supply
Figure 002




Flight Interphone - System Architecture
Figure 003




Flight Interphone - System Architecture
Figure 004

The amplifier output audio signal is fed to the stations previously mentioned.

**ON A/C 101-200,

In flight interphone mode, the microphone signals from the Captain's, First Officer's, Third Occupant's, jack for connection of the oxygen mask microphone, flight interphone jack in the ground power receptacle housing and jack panel in the avionics compartment are fed to the flight interphone amplifier on separate inputs. The amplifier output audio signal is fed to the stations previously mentioned.

**ON A/C ALL

6. Associated Peripheral Systems

The flight interphone system is completed by the ground crew call system (Ref. 23-42).

7. Flight Interphone Amplifier

A. Description

The flight interphone amplifier comprises :

- 7 independent microphone inputs for the different stations of the network
  . input impedance : 150 ohms
  . input level : 0.250 V
- 2 audio outputs : a 125 ohm output for flight interphone jack 4RL and a 50 ohm output for the other stations
  . output maximum power : 125 mW on both outputs.

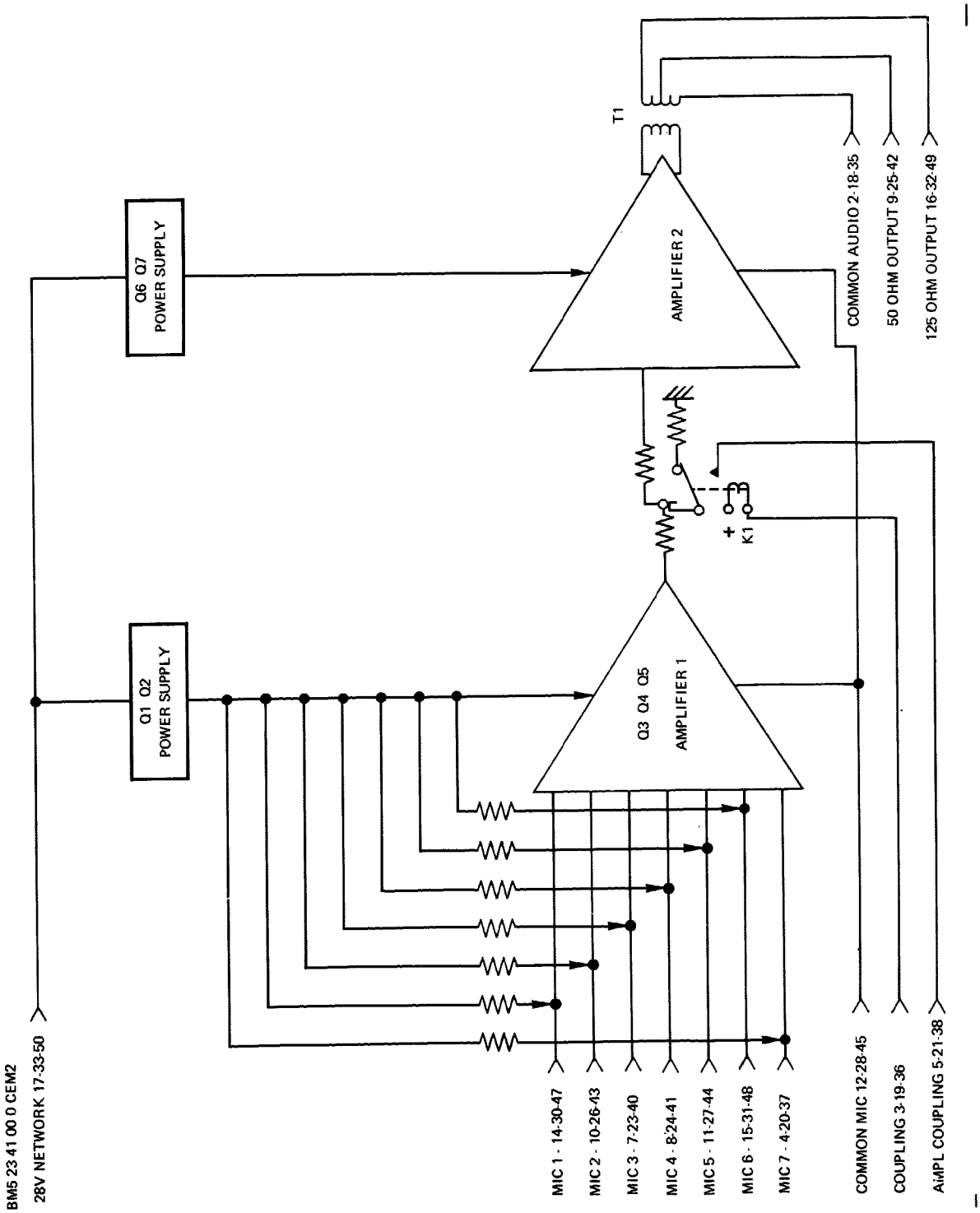
The electronic part comprises two amplifier stages, two regulated power supplies and a network coupling relay.

B. Operation

(Ref. Fig. 005)

R **ON A/C 101-104,

The input signal from the various microphones used in the aircraft (hand microphone, boomset, mask microphone, handset) is applied to inputs 1 to 7 for high points and to the common microphone for low points.
On high-point inputs, a regulated power supply (transistor Q1, Q2) provides the voltage necessary to the microphone series power supply.
The input signal is fed to a first amplifier stage made up of transistors Q3, Q4, Q5 and is then sent to the output stage made up a of built-in circuit and transformer T1.
The amplified AF output signal is then available on both 50 and 125 ohm outputs. Relay K1 (network coupling relay), between the two amplifier stages, enables, when circuit is utilized, connection of flight interphone and service interphone amplifiers.




Flight Interphone Amplifier
Figure 005

R **ON A/C 001-100, 105-200,

The input signal from the various microphones used in the aircraft (hand microphone, boomset, mask microphone, handset) is applied to inputs 1 to 7 for high points and to the common microphone for low points.
On high-point inputs, a regulated power supply (transistor Q1, Q2) provides the voltage necessary to the microphone series power supply.
The input signal is fed to a first amplifier stage made up of transistors Q3, Q4, Q5 and is then sent to the output stage made up a of built-in circuit and transformer T1.
The amplified AF output signal is then available on both 50 and 125 ohm outputs. For information, relay K1 (network coupling relay), between the two amplifier stages, enables, when circuit is utilized, connection of flight interphone and service interphone amplifiers only when an interphone coupling switch is installed.

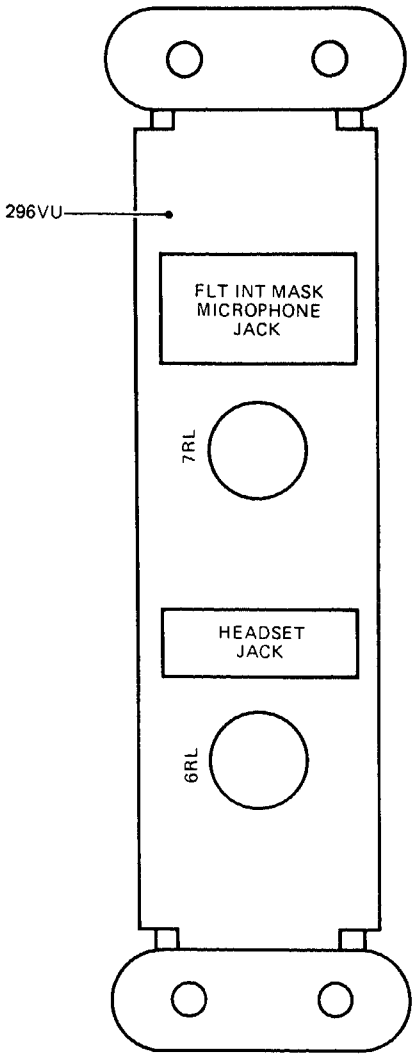
**ON A/C ALL

8. Full Face Oxygen Mask Connection Box

A. Description
(Ref. Fig. 006)
(1)The full face oxygen mask connection box allows connection of :
- a headset
- a microphone incorporated in a full face oxygen mask.
The connection box comprises a preamplifier which enables the low-level microphone (mask) to be used.
(2)The face features
- a jack (HEADSET JACK) for connection of a headset
- a jack (FLT INT MASK MICROPHONE JACK) for connection of a microphone.
(3)The back is equipped with a connector for connection with the audio intercommunication unit 1RN.
(4)Inside the connection box is a preamplifier.

B. Operation
(1)Reception circuit
The reception signals from the flight interphone amplifier (50 ohm output) arrive at pins E (AUDIO HI) and B (AUDIO LO) of connector A.
These signals are directly sent to the headset connected in C.
(2)Microphone circuit
The microphone signals from the microphone incorporated in the full face oxygen mask, connector B are fed to the preamplifier.
The preamplifier output signal is sent to pins F (MIKE HI) and C (MIKE LO) of connector A.
The signal is then fed to the flight interphone amplifier (input No. 7).
(Ref. Fig. 007)

9. Flight Interphone Jack (Ground Mechanic)

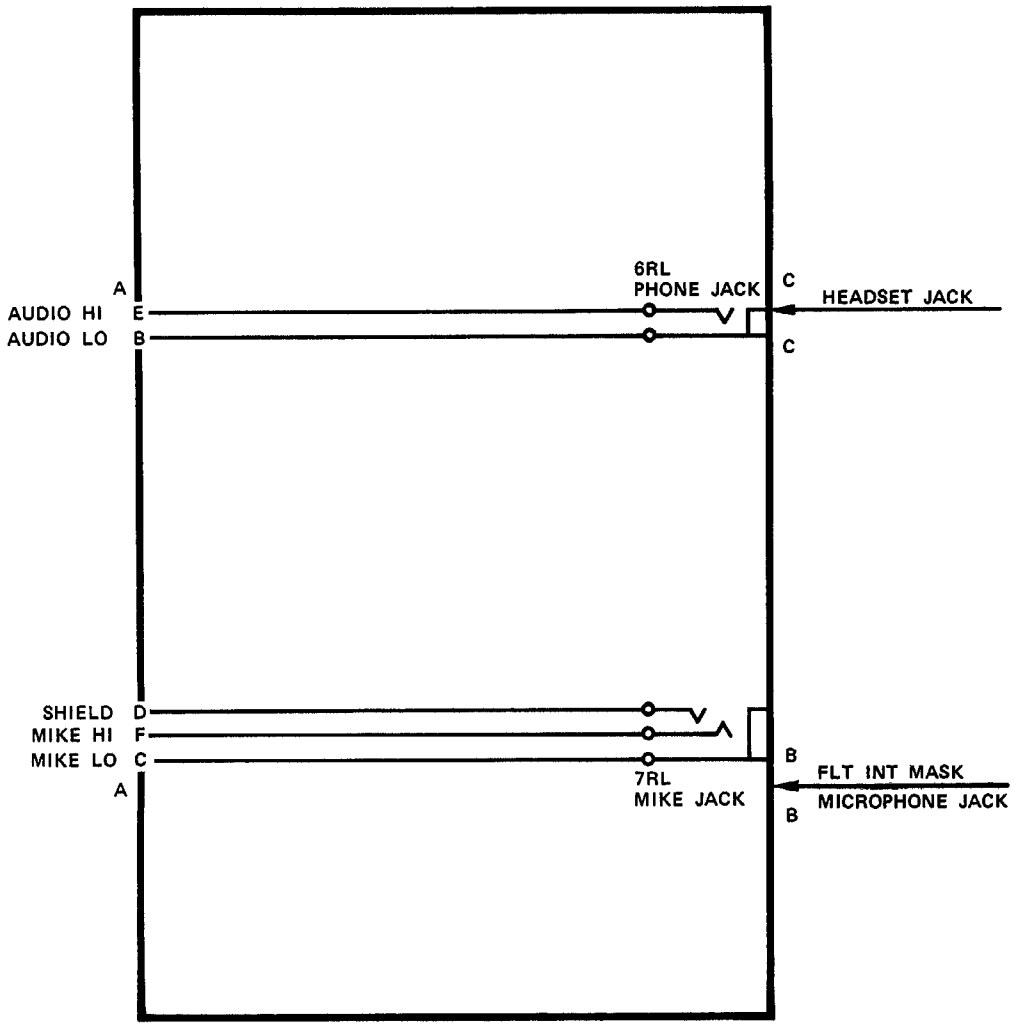



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Flight Interphone - Full Face Oxygen Mask Connection Box
Figure 006



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Full Face Oxygen Mask Connection Box - Schematic
Figure 007

A. Description

The flight interphone jack which enables connection of ground service acoustic equipment is installed in the aircraft ground power receptacle housing.

This jack is connected directly to the flight interphone amplifier.

It allows communications between the crew members and a ground mechanic.

B. Operation

The reception signals from the flight interphone amplifier (125 ohm output) are fed directly to the flight interphone jack. The microphone signals (high-level) from the ground service acoustic equipment are fed directly to the flight interphone amplifier (input No.6).

R

1. Operational Test

A. Reason for the Job
To check reception and transmission from any station (crew member's and ground).

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | boomset |
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure
WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.

(1)Job Set-Up

NOTE : The following adjustment/test procedure will be performed at any crew member's station.

(a)Energize the aircraft electrical network (Ref. 23-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)Close overhead panel circuit breakers, particularly those associated with AUDIO SYS, COM and CALLS systems.

(2)Test

| ACTION | RESULT |
|---|---|
| 1. At any one station<br>- place RADIO/INTER switch in INTER position | |
| 2. At any one station<br>- speak into hand microphone while holding PTT switch on. | Check reception at boomset at any other stations. |

(3)Close-Up

(a)Place RADIO/INTER switch at selected station intermediate position.
(b)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(c)Remove all ground handling and maintenance equipment, standard and special tools, together with ground power equipment, all access equipment and miscellaneous items.

R

1. General

The ground crew call system, through aural and visual indications, enables communications

- from the flight compartment to the ground
- from the avionics compartment to the flight compartment.

2. Component Location

(Ref. Fig. 001)

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 2RM | P/BSW-CALLS/RESET | 423VU | 210 | | |
| 2WC | P/BSW-CALLS/MECH CALL | 423VU | 210 | | |
| 3WC | INTERPHONE BOX | | | | 23-42-12 |
| 4WC | HORN-MECH CALL | | | | 23-42-21 |
| 17WC | P/BSW-COCKPIT CALL | 108VU | 122 | | |
| 72GB | RELAY-R MLG SHOCK ABSORBER (FLIGHT/GROUND) | 104VU | 120 | 121BL | |

3. System Description

(Ref. Fig. 002)

The ground crew call system consists of :

A. An interphone box 3WC enabling when aircraft is on the ground calls and voice communications between the crew members in the flight compartment and the ground mechanic.

B. A blue MECH/CALL pushbutton switch 2WC associated with a RESET pushbutton switch 2RM located on panel 423VU.

C. A horn 4WC which sounds when the crew members call the ground mechanic.

D. A circuit breaker 1WC supplying the indicator lights and the horn with 28VDC power.

E. A COCKPIT CALL pushbutton switch 17WC associated with a RESET pushbutton switch 2RM located on panel 423VU.

4. Component Description

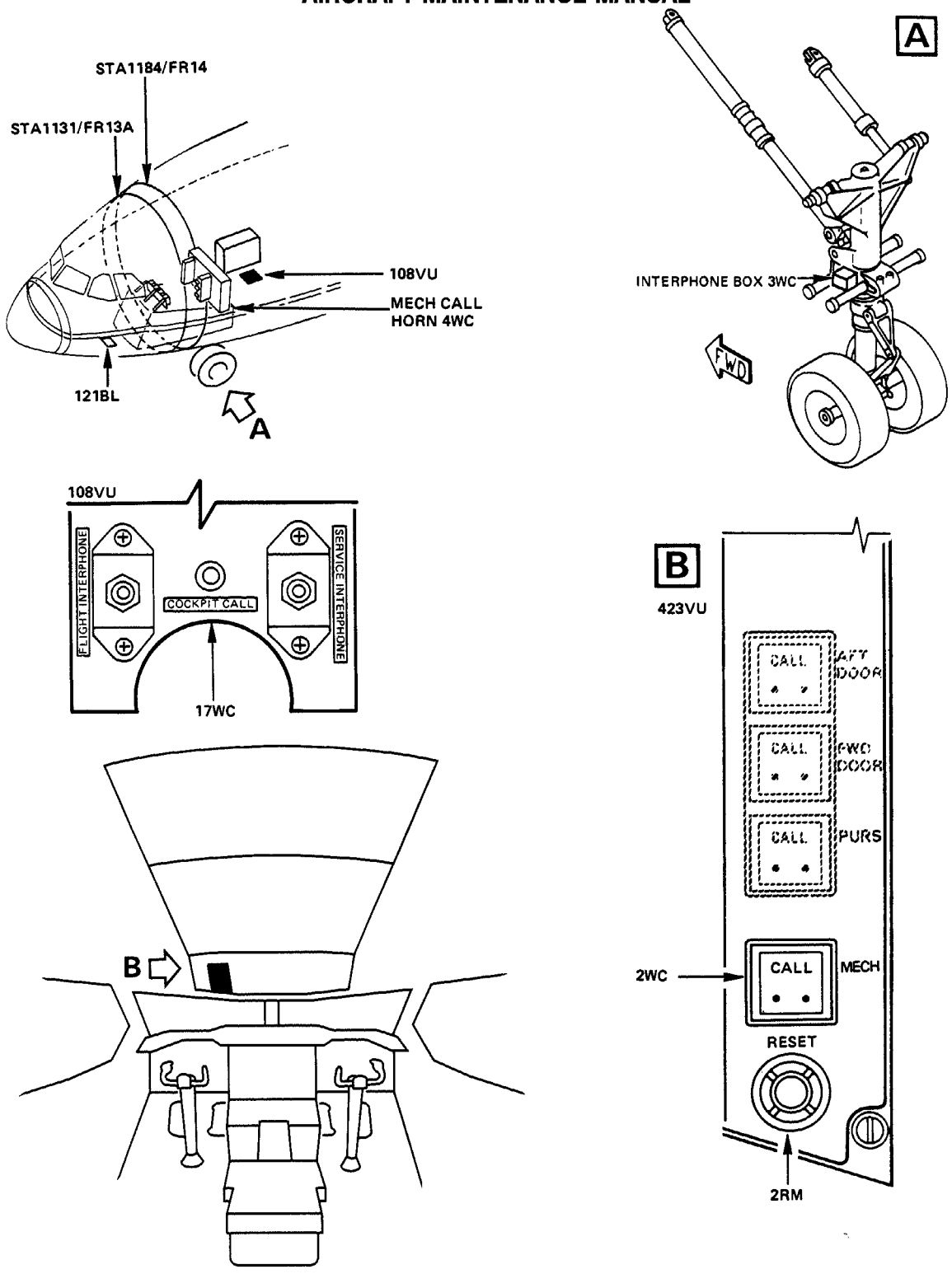
A. Interphone Box

(Ref. Fig. 003)

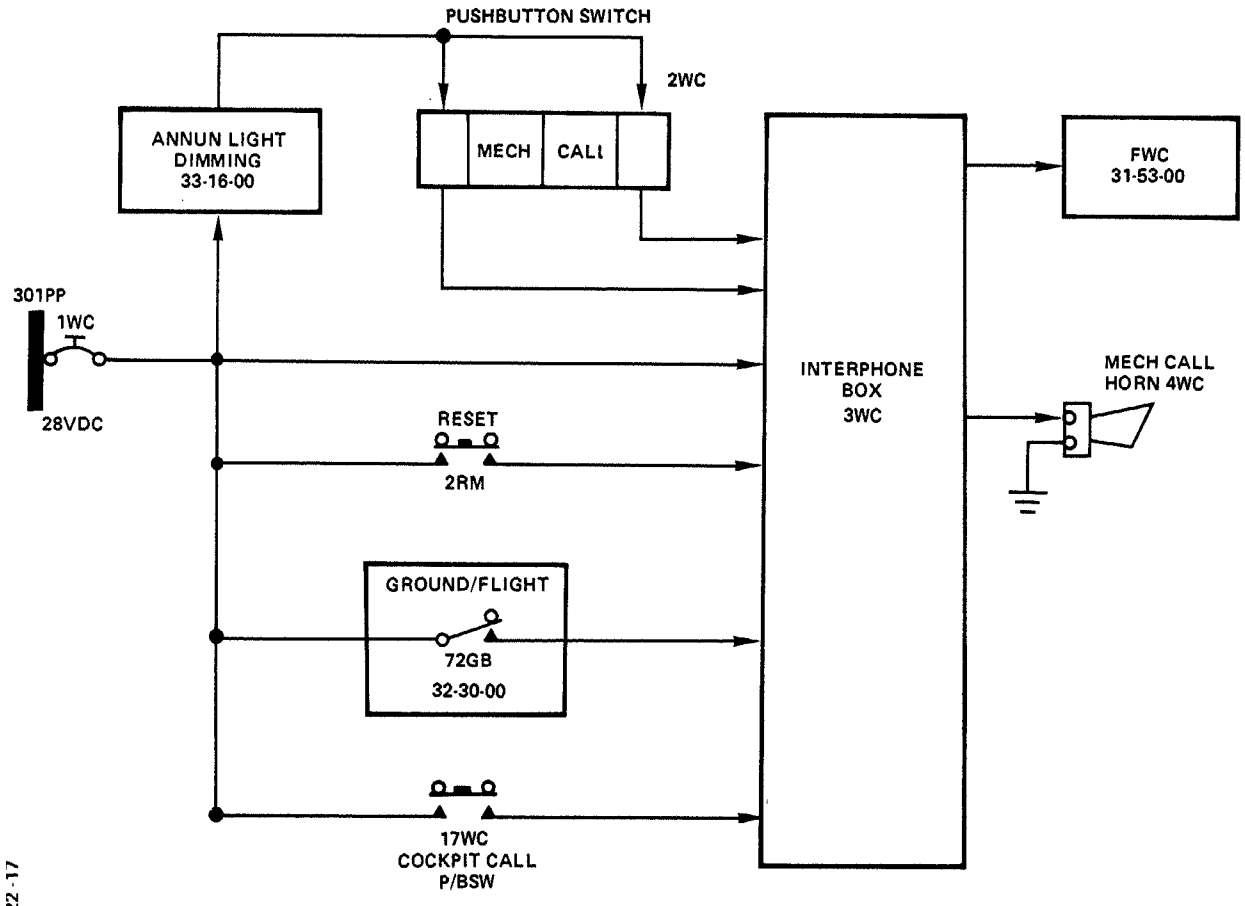
The interphone box is located on nose gear leg.

On the face :

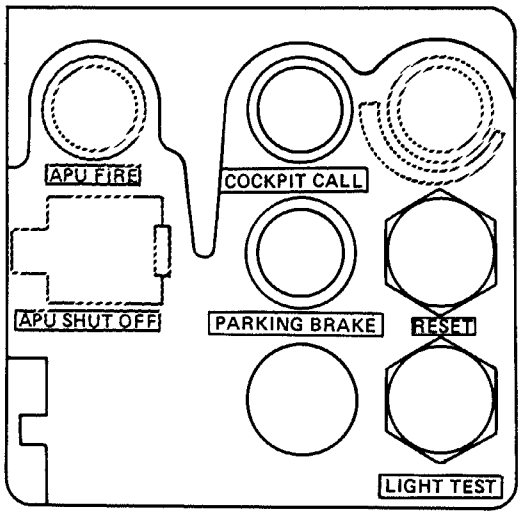
- A blue COCKPIT CALL indicator light illuminating when the crew members want to establish communication with the ground mechanic.
- A RESET pushbutton switch enabling to extinguish the blue COCKPIT CALL




Ground Crew Call System - Component Location
Figure 001




Ground Crew Call - Block Diagram
Figure 002




DM5 23 42 00 0 AEM3 11 17
BM5

Ground Crew Call - Interphone Box
Figure 003

indicator light.
- **A LIGHT TEST** pushbutton switch enabling the test of the **COCKPIT CALL** indicator light.

Also, an **APU SHUT OFF** pushbutton switch protected by cover, and one **APU FIRE** and one **INS RACK VENT** red warning light and **PARKING BRAKE** amber warning light are located on the interphone box.

**B. Blue MECH/CALL Pushbutton Switch 2WC**
- the blue **CALL** legend comes on when the mechanic in the avionics compartment wants to establish communication with the crew members.

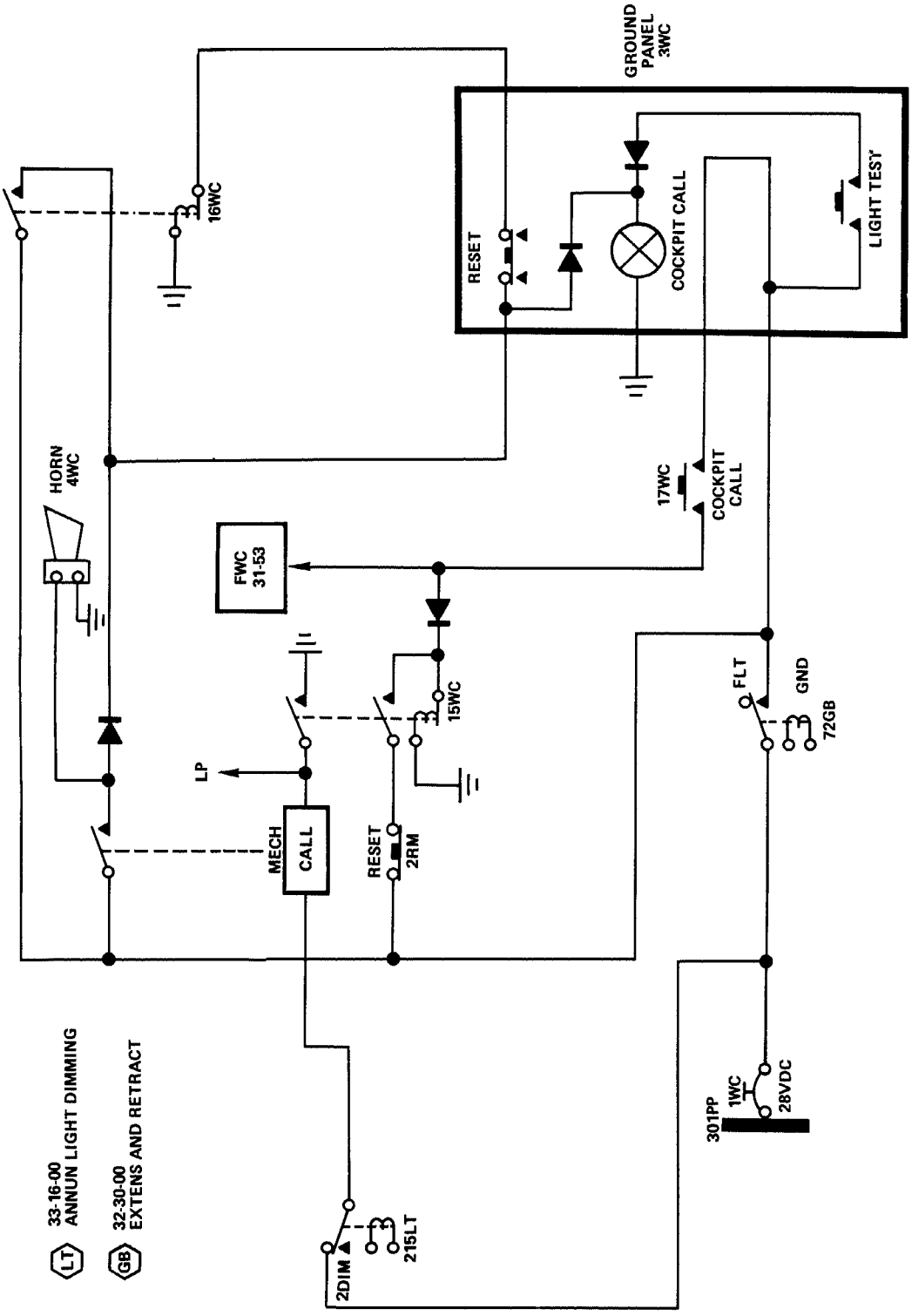
**C. RESET Pushbutton Switch 2RM**
This pushbutton switch enables to extinguish the **MECH/CALL** pushbutton switch after a call from the mechanic in the avionics compartment.

**D. Horn 4WC**
The horn located in the nose gear well, supplied with **28VDC** through the contacts of **MECH CALL** pushbutton switch, sounds just the time the pushbutton switch is pressed.

5. Operation
(Ref. Fig. 004)

A. Crew Member-to-Ground Mechanic Call
When pressing MECH CALL pushbutton switch, a +28VDC signal is applied to the COCKPIT CALL indicator light through
- the normally open (NO) contacts of relay 72GB
- the auxiliary contacts of the MECH CALL pushbutton switch.
Horn 4WC is supplied with +28VDC power through
- the normally open (NO) contacts of relay 72GB
- the auxiliary contacts of MECH CALL pushbutton switch when pressed
Pressing the RESET pushbutton switch located on the interphone box returns the circuit to their initial configuration, thus causing the COCKPIT CALL indicator light to go off.

B. Avionics Compartment Mechanic-to-Crew Member Call
When pressing the COCKPIT CALL pushbutton switch on panel 108VU, a+28VDC signal is applied to relay 15WC through the normally open (NO) contacts of relay 72GB. The normally open (NO) contacts of relay 15WC connect MECH CALL pushbutton switch 2WC to ground. The blue CALL legend of the pushbutton switch comes on fed with 28VDC through the normally closed (NC) contacts of relay 215LT and with a ground resulting from relay 15WC.
The 28VDC signal is also applied to the FWC (flight warning computer) to trigger the buzzer circuit which feeds the audio signal to the aural warning loudspeakers for one second.
The blue legend of the MECH/CALL pushbutton switch is dimmed by switch 6LP placed in DIM position through the normally open (NO) contacts of relay 215LT.
The blue CALL legend of the pushbutton switch can be extinguished by pressing RESET pushbutton switch 2RM.




BM5 23 42 00 0 AHM2 - 01

Ground Crew Call - Interconnection Schematic
Figure 004

1. Operational Test

A. Reason for the Job
To check call between flight compartment and ground.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Ammeter |
| (2) | Earmuffs |
| Referenced Procedures | |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 23-42-21, P. Block 401 | Horn |

C. Procedure
WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.

(1)Job set-up
(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)Close circuit breakers, particularly those associated with ECAM and CALLS on overhead panel 21VU, and those associated with landing gear on panel 133VU and those associated with ANN LT TEST on panel 131VU.

(2)Test
(a)Annunciator light test

| ACTION | RESULT |
|---|---|
| 1. On nose gear leg, on interphone box 3WC, press LIGHT TEST pushbutton switch | The following annunciator lights come on :<br>- COCKPIT CALL<br>- APU FIRE<br>- INS/IRS RACK VENT.<br>- PARKING BRAKE. |

R (b)Test of crew member-to-ground mechanic call

| ACTION | RESULT |
|---|---|
| 1. On overhead panel 423VU<br>- press then release CALLS/MECH CALL pushbutton switch 2WC | - On interphone box 3WC COCKPIT CALL indicator light comes on<br>- mechanic call horn 4WC sounds during the time CALLS/MECH CALL pushbutton switch is pressed. |
| 2. On interphone box 3WC<br>- press RESET pushbutton switch | - COCKPIT CALL indicator light goes off. |

(c)Test of ground member-to-crew members call

| ACTION | RESULT |
|---|---|
| 1. On EXT PWR panel 108VU<br>- press COCKPIT CALL pushbutton switch 17WC | - On overhead panel 423VU, blue CALL legend of CALLS/MECH CALL pushbutton switch comes on<br>- Buzzer and warning are audible |
| - release COCKPIT CALL pushbutton switch 17WC | - on panel 423VU, blue CALL legend of CALLS/MECH CALL pushbutton switch remains on<br>- Buzzer and warning stop. |
| 2. On panel 423VU<br>- press RESET pushbutton switch | - Blue CALL legend of CALLS/MECH CALL pushbutton switch goes off. |

# INTERPHONE BOX (3WC) - REMOVAL/INSTALLATION

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. Material No. 09-001 | Sealants (Ref. 20-31-00) |
| C. | Blanking Caps |
| D. | Lockwire 0.6 mm (0.024 in.) Dia., Corrosion - Resistant Steel |
| Referenced Procedures | |
| - 21-21-00, P. Block 501 | Flight Compartment And Electronics Racks Air Distribution |
| - 23-42-00, P. Block 501 | Ground Crew Call System |
| - 32-51-00, P. Block 501 | Steering |
| - 26-22-00, P. Block 501 (Ref. Fig. 401) | APU Fire Extinguishing |

## 2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers :

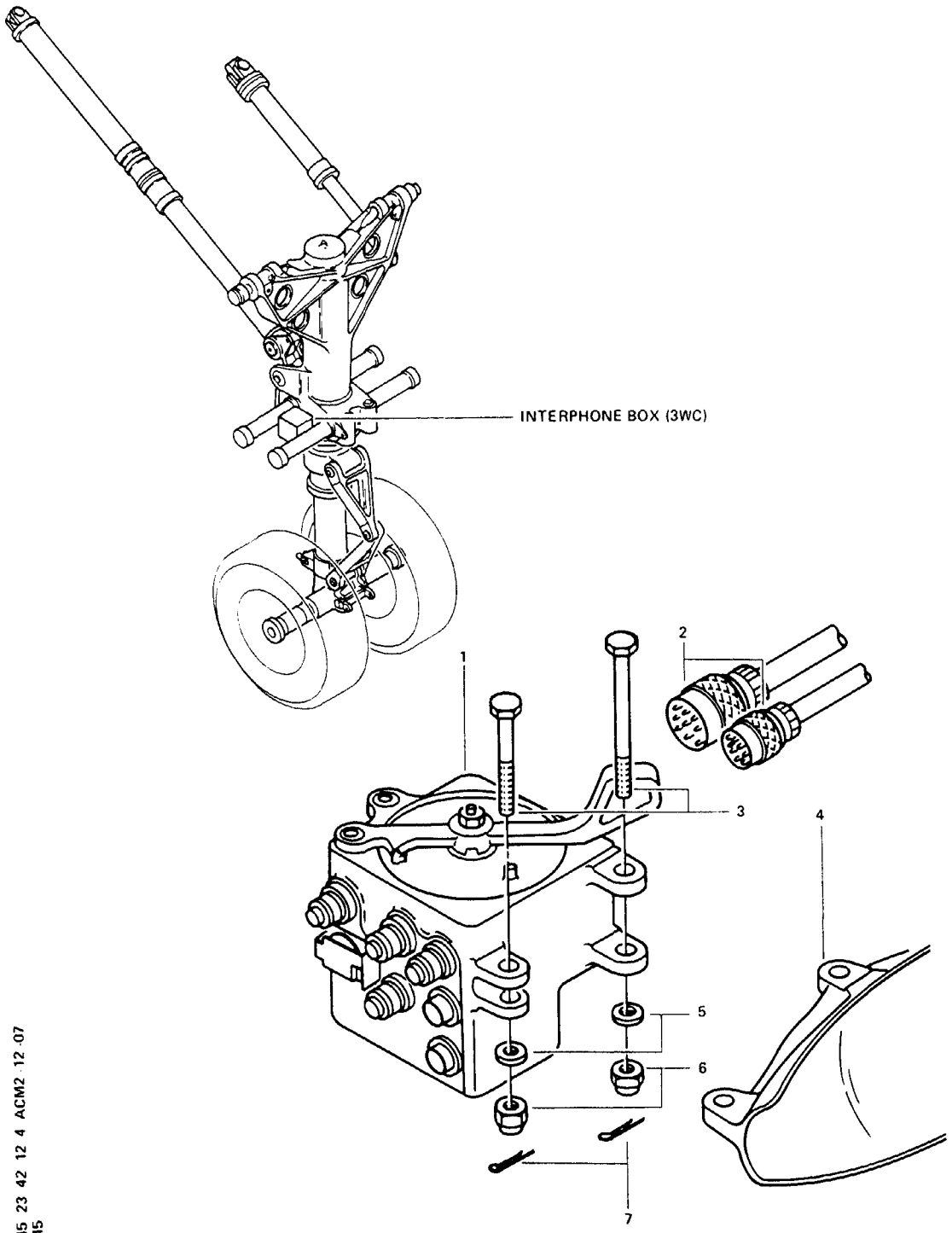
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | CALLS/MECH | 1WC | 101/J8 |
| 131VU | VENTILATION/BLOWER WARN | 76HQ | 311/H60 |
| 133VU | HYDRAULIC/NOSE WHEEL STRG | 1GC | 333/T53 |
| R 281VU | NAVIGATION/IRS1/BAT | 313FP1 | A8 |

B. Removal

(1)Remove coating with a spatula taking care not to damage protective finish on bolts (3) and nuts (6).
(2)Cut and remove lockwire from electrical connectors (2).
(3)Disconnect electrical connectors (2).
(4)Remove cotter pins (7), nuts (6), washers (5) and bolts (3).
(5)Remove interphone box (1) from mount (4).
(6)Cap electrical connectors (2).

C. Installation

(1)Clean and inspect interphone box (1) interface.
(2)Remove blanking caps from electrical connectors (2). Check for correct condition of connectors.
(3)Position interphone box (1) on mount (4).
(4)Install bolts (3), washers (5), nuts (6). Tighten and safety with cotter pins (7).
(5)Coat bolt (3) heads and nuts (6) with Material No. 09-001.
(6)Connect electrical connectors (2) to interphone box (1) and safety with 0.6 mm (0.024 in.) corrosion-resistant steel lockwire.
(7)Remove safety clips and tags and close circuit breakers 1WC,




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DM5

Interphone Box
Figure 401

313FP1, 76HQ and 1GC.

D. Tests
(1)Carry out operational test of the flight compartment and electronics racks air distribution system (Ref. 21-21-00, P. Block 501).
(2)Carry out operational test of ground crew call system (Ref. 23-42-00, P. Block 501).
(3)Carry out operational test of the steering control system (Ref. 32-51-00, P. Block 501).
(4)Carry out operational test of the APU fire extinguishing system (Ref. 26-22-00, P. Block 501).

E. Close-Up
Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

# MECHANIC CALL HORN (4WC) - REMOVAL/INSTALLATION

R

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform 2 m (6 ft. 7 in.) |
| B. | Circuit Breaker Safety Clips |
| C. | Blanking Caps |
| Referenced Procedures | |
| - 23-42-00, P. Block 501 | Ground Crew Call System |
| - 32-22-11, P. Block 301 | Nose Gear Main Door - (Ground Door(s) Opening) |

## 2. Procedure

A. Job Set-Up
(1)Open nose gear doors (Ref. 32-22-11, P. Block 301)
(2)Position access platform 2 m (6 ft. 7 in.) to gain access to nose gear well.
(3)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | CALLS/MECH | 1WC | 101/J 8 |
| 281VU | NAVIGATION/IRS 1 BAT | 313FP1 | A8 |

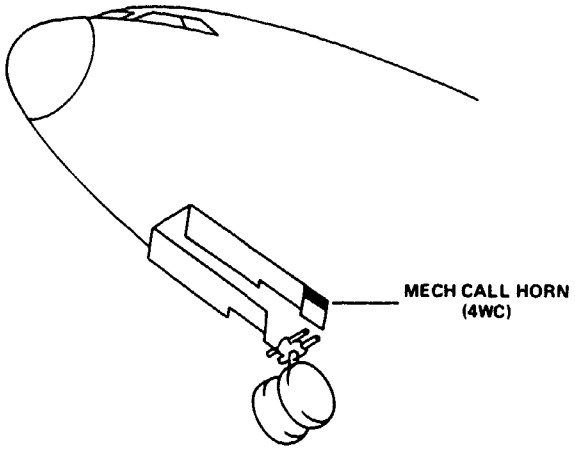
CAUTION : IRS 1 MUST BE OFF, BECAUSE IT IS SUPPLIED BY C/B 313 FP1, SO AS TO AVOID IRS 1 FAILURE INDICATING.

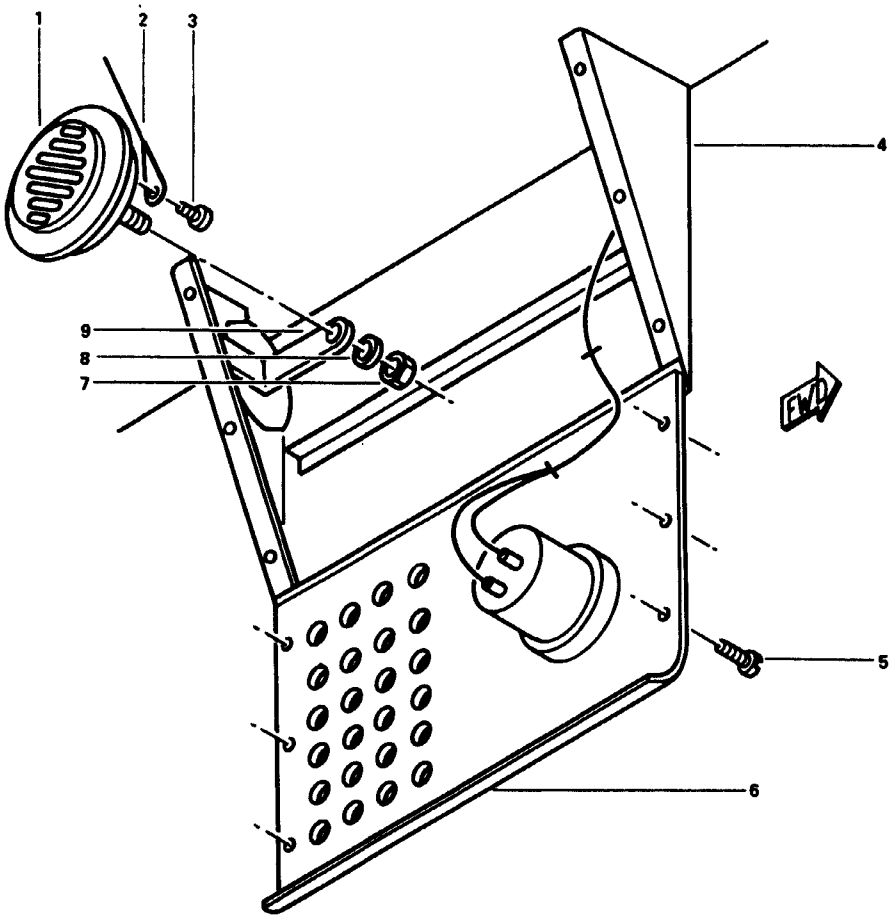
NOTE : If the horn is dispatched inoperative with C/B 1 WC, disconnect electrical supply wire, so as not to interrupt the power of the IRS 1.

B. Removal
(1)Remove six screws (5) while holding casing (4) door (6).
(2)Progressively open casing (4) door (6).
(3)Remove nut (3) and disconnect electrical supply wire (2).
(4)Remove nut (7) and washer (8).
(5)Remove horn (1) from its bracket (9).

C. Installation
(1)Install horn (1) on its bracket (9).
(2)Install washer (8) and nut (7) and tighten.
(3)Connect electrical supply wire (2), install nut (3) and tighten.
(4)Close casing (4) door (6) and secure with six screws (5).
(5)Remove safety clip and tag, and close circuit breakers 1WC, 313 FP1.

D. Test
Carry out operational test of ground crew call system (Ref. 23-42-00, P. Block 501).




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DM5

Mechanic Call Horn
Figure 401

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Remove access platform.
(3)Close nose gear doors (Ref. 32-22-11, P. Block 301).

# CABIN AND FLIGHT CREW CALL SYSTEM
## DESCRIPTION AND OPERATION

1. General

The cabin and flight crew call system is designed to provide a convenient means by which the cabin and flight crew may attract each others attention for subsequent communication.
The system consists of flight crew and attendant call panels, electronic control and relay boxes and a red area light.
Audio annunciation through the passenger address (PA) system accompanies each call.

A. Operation of 'RESET' button resets all calls from the flight compartment.

B. The captain need not press the 'RESET' button to reset the call indication in the flight compartment.

C. 'ALL ATTND' call is designed as an urgent call, upon activating this button all other calls are reset.
(Ref. Fig. 001)

2. Component Location

R **ON A/C 001-100,

(Ref. Fig. 002)

R **ON A/C 101-200,

R (Ref. Fig. 003)

R **ON A/C 001-100,

(Ref. Fig. 004)

R **ON A/C 101-200,

R (Ref. Fig. 005)

R **ON A/C 001-100,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 2RM | SWITCH PUSHBUTTON-RESET | 423VU | 210 | | |
| 3RM | SWITCH PUSHBUTTON-PURSER CALL | 423VU | 210 | | |
| 4RM | SWITCH PUSHBUTTON-MID GALY ATTND CALL | 423VU | 210 | | |
| 5RM | SWITCH PUSHBUTTON-AFT DOOR ATTND CALL | 423VU | 210 | | |
| 6RM | SWITCH PUSHBUTTON-ALL ATTND CALL | 423VU | 210 | | |
| 7RM | INDICATOR LIGHT-CAPT | 878VU | 221 | | |
| 8RM | INDICATOR LIGHT-ATTN | 878VU | 221 | | |

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 9RM | KEYBOARD-PURSERS STATION | 878VU | 221 | | |
| 11RM | INDICATOR LIGHT-CAPT | 784VU | 222 | | |
| 12RM | INDICATOR LIGHT-ATTN | 784VU | 222 | | |
| 13RM | MICROSWITCH-TELEPHONE HANDSET | 878VU | 221 | | |
| 19RM | MICROSWITCH-TELEPHONE HANDSET | 784VU | 222 | | |
| 25RM | INDICATOR LIGHT-PURS | 784VU | 222 | | |
| 26RM | SWITCH PUSHBUTTON-FWD DOOR ATTND CALL | 423VU | 210 | | |
| 28RM | INDICATOR LIGHT-CAPT | 778VU | 262 | | |
| 29RM | INDICATOR LIGHT-PURS | 778VU | 262 | | |
| 30RM | INDICATOR LIGHT-ATTN | 778VU | 262 | | |
| 31RM | KEYBOARD-RH AFT ATTND STATION | 726VU | 262 | | |
| 34RM | MICROSWITCH-TELEPHONE HANDSET | 726VU | 262 | | |
| 35RM | INDICATOR LIGHT-CAPT | 866VU | 261 | | |
| 36RM | INDICATOR LIGHT-PURS | 866VU | 261 | | |
| 37RM | INDICATOR LIGHT-ATTN | 866VU | 261 | | |
| 38RM | KEYBOARD-LH AFT ATTND STATION | 727VU | 261 | | |
| 41RM | MICROSWITCH-TELEPHONE HANDSET | 727VU | 261 | | |
| 47RM1 | MASTER PC BOARD, CAPTAIN, encloses: | 786VU | 234 | | |
| 42RM1 | PC BOARD CODER | 786VU | 234 | | |
| 42RM1-1 | ADAPTER CAPTAIN STATION 40 POL | 786VU | 234 | | |
| 43RM1 | PC BOARD CODER DECODER | 786VU | 234 | | |
| 44RM1 | PC BOARD DECODER | 786VU | 234 | | |
| 44RM1-1 | ADAPTER CAPTAIN STATION 48 POL | 786VU | 234 | | |
| 45RM1 | PC BOARD AMPLIFIER | 786VU | 234 | | |
| 47RM2 | MASTER PC BOARD, PURSER, encloses: | 786VU | 234 | | |
| 42RM2 | PC BOARD CODER | 786VU | 234 | | |
| 42RM2-1 | ADAPTER PURSER STATION 40 POL | 786VU | 234 | | |
| 43RM2 | PC BOARD CODER DECODER | 786VU | 234 | | |
| 44RM2 | PC BOARD DECODER | 786VU | 234 | | |
| 44RM2-1 | ADAPTER PURSER STATION 48 POL | 786VU | 234 | | |
| 45RM2 | PC BOARD AMPLIFIER | 786VU | 234 | | |
| 47RM6 | MASTER PC BOARD, ATTND 1R, encloses: | 786VU | 234 | | |
| 42RM6 | PC BOARD CODER | 786VU | 234 | | |
| 42RM6-1 | ADAPTER FWD ATTND STATION 40 POL | 786VU | 234 | | |
| 43RM6 | PC BOARD CODER DECODER | 786VU | 234 | | |
| 44RM6 | PC BOARD DECODER | 786VU | 234 | | |
| 44RM6-1 | ADAPTER FWD ATTND STATION 48 POL | 786VU | 234 | | |
| 45RM6 | PC BOARD AMPLIFIER | 786VU | 234 | | |
| 48RM | MASTER PC-BOARD, ATTND 2 L/R encloses: | 787VU | 244 | | |
| 42RM | PC BOARD CODER | 787VU | 244 | | |
| 42RM-1 | ADAPTER EMER EXIT STATION 40 POL | 787VU | 244 | | |
| 43RM | PC BOARD CODER DECODER | 787VU | 244 | | |
| 44RM | PC BOARD DECODER | 787VU | 244 | | |
| 44RM-1 | ADAPTER EMER EXIT STATION 48 POL | 787VU | 244 | | |
| 45RM | PC BOARD AMPLIFIER | 787VU | 244 | | |
| 46RM | PC BOARD CLOCK GENERATOR | 787VU | 244 | | |
| 47RM3 | MASTER PC-BOARD, AFT ATTEND 3 L/R encloses: | 788VU | 263 | | |

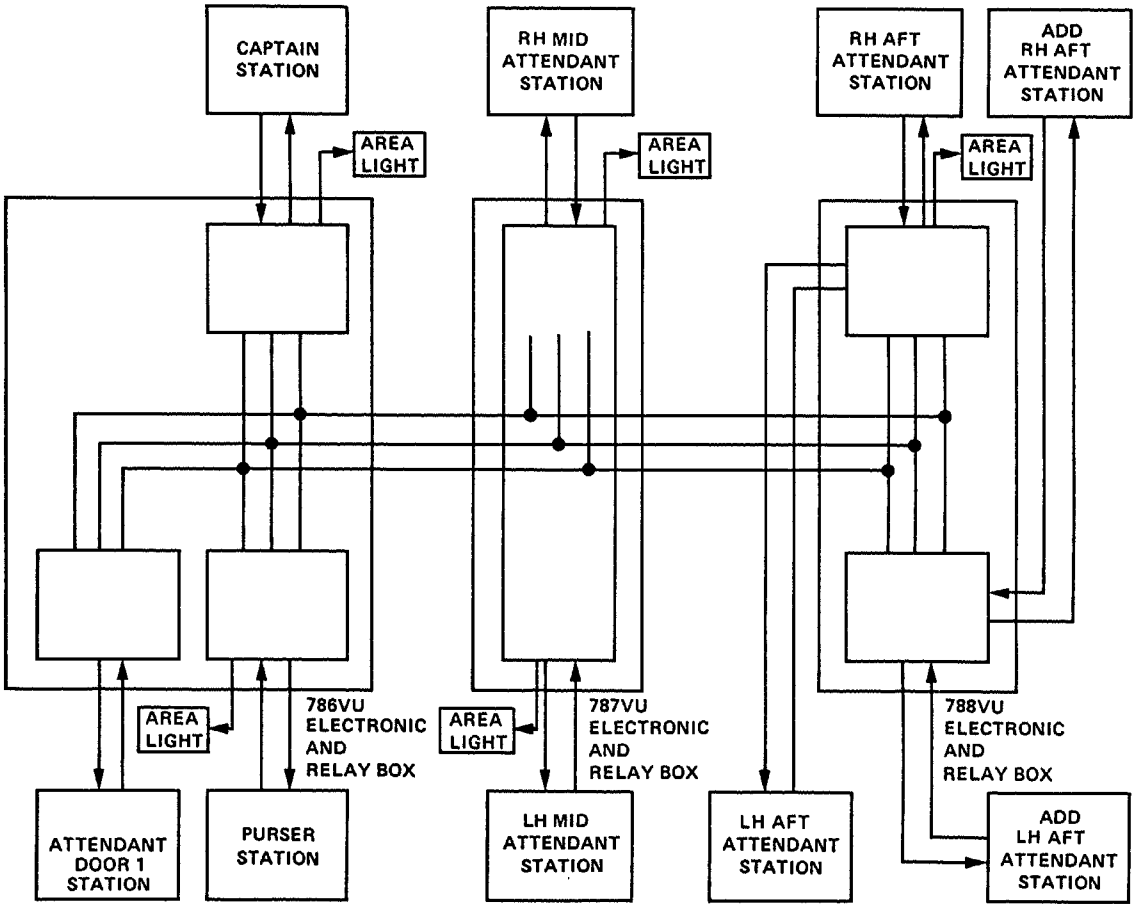
| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 42RM3 | PC BOARD CODER | 788VU | 263 | | |
| 42RM3-1 | ADAPTER AFT ATTEND STATION 40 POL | 788VU | 263 | | |
| 43RM3 | PC BOARD CODER DECODER | 788VU | 263 | | |
| 44RM3 | PC BOARD DECODER | 788VU | 263 | | |
| 44RM3-1 | ADAPTER AFT ATTND STATION 48 POL | 788VU | 263 | | |
| 45RM3 | PC BOARD AMPLIFIER | 788VU | 263 | | |
| 92RM | KEYBOARD-RH FWD ATTN STATION | 784VU | 222 | | |
| 102RM | INDICATOR LIGHT-CAPT | 1308VU | 240 | | |
| 103RM | INDICATOR LIGHT-PURS | 1308VU | 240 | | |
| 104RM | INDICATOR LIGHT-ATTN | 1308VU | 240 | | |
| 105RM | MICROSWITCH-TELEPHONE HANDSET | 1308VU | 240 | | |
| 106RM | KEYBOARD-GALLEY 2 ATTND STATION | 1308VU | 240 | | |
| 2LN | LIGHT PANEL-AREA | 850VU | 224 | | 33-23-11 |
| 6LN | LIGHT PANEL-AREA | | 234 | | 33-23-11 |
| 11LN | LIGHT PANEL-AREA | 849VU | 223 | | 33-23-11 |
| 15LN | LIGHT PANEL-AREA | | 233 | | 33-23-11 |
| 16LN | LIGHT PANEL-AREA | 840VU | 254 | | 33-23-11 |
| 25LN | LIGHT PANEL-AREA | 841VU | 253 | | 33-23-11 |
| 49LN | LIGHT PANEL-AREA | | 230 | | 33-23-11 |

R **ON A/C 101-200,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 2RM | SWITCH PUSHBUTTON-RESET | 423VU | 210 | | |
| 3RM | SWITCH PUSHBUTTON-PURSER CALL | 423VU | 210 | | |
| 4RM | SWITCH PUSHBUTTON-MID GALY ATTND CALL | 423VU | 210 | | |
| 5RM | SWITCH PUSHBUTTON-AFT DOOR ATTND CALL | 423VU | 210 | | |
| 6RM | SWITCH PUSHBUTTON-ALL ATTND CALL | 423VU | 210 | | |
| 7RM | INDICATOR LIGHT-CAPT | 878VU | 221 | | |
| 8RM | INDICATOR LIGHT-ATTN | 878VU | 221 | | |
| 9RM | KEYBOARD-PURSERS STATION | 878VU | 221 | | |
| 11RM | INDICATOR LIGHT-CAPT | 784VU | 222 | | |
| 12RM | INDICATOR LIGHT-ATTN | 784VU | 222 | | |
| 13RM | MICROSWITCH-TELEPHONE HANDSET | 878VU | 221 | | |
| 19RM | MICROSWITCH-TELEPHONE HANDSET | 784VU | 222 | | |
| 14RM | INDICATOR LIGHT-CAPT | 882VU | 242 | | |
| 15RM | INDICATOR LIGHT-PURS | 882VU | 242 | | |
| 16RM | INDICATOR LIGHT-ATTN | 882VU | 242 | | |
| 17RM | KEYBOARD-RH EMER EXIT ATTND STATION | 882VU | 242 | | |
| 20RM | MICROSWITCH-TELEPHONE HANDSET | 882VU | 242 | | |
| 21RM | INDICATOR LIGHT-CAPT | 880VU | 241 | | |
| 22RM | INDICATOR LIGHT-PURS | 880VU | 241 | | |
| 23RM | INDICATOR LIGHT-ATTN | 880VU | 241 | | |
| 24RM | KEYBOARD-LH EMER EXIT ATTND STATION | 880VU | 241 | | |
| 27RM | MICROSWITCH-TELEPHONE HANDSET | 880VU | 241 | | |

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 25RM | INDICATOR LIGHT-PURS | 784VU | 222 | | |
| 26RM | SWITCH PUSHBUTTON-FWD DOOR ATTND CALL | 423VU | 210 | | |
| 28RM | INDICATOR LIGHT-CAPT | 726VU | 262 | | |
| 29RM | INDICATOR LIGHT-PURS | 726VU | 262 | | |
| 30RM | INDICATOR LIGHT-ATTN | 726VU | 262 | | |
| 31RM | KEYBOARD-RH AFT ATTND STATION | 726VU | 262 | | |
| 34RM | MICROSWITCH-TELEPHONE HANDSET | 726VU | 262 | | |
| 35RM | INDICATOR LIGHT-CAPT | 727VU | 261 | | |
| 36RM | INDICATOR LIGHT-PURS | 727VU | 261 | | |
| 37RM | INDICATOR LIGHT-ATTN | 727VU | 261 | | |
| 38RM | KEYBOARD-LH AFT ATTND STATION | 727VU | 261 | | |
| 41RM | MICROSWITCH-TELEPHONE HANDSET | 727VU | 261 | | |
| 47RM1 | MASTER PC BOARD, encloses: | 786VU | 234 | | |
| 42RM1 | PC BOARD CODER | 786VU | 234 | | |
| 42RM1-1 | ADAPTER CAPTAIN STATION 40 POL | 786VU | 234 | | |
| 43RM1 | PC BOARD CODER DECODER | 786VU | 234 | | |
| 44RM1 | PC BOARD DECODER | 786VU | 234 | | |
| 44RM1-1 | ADAPTER CAPTAIN STATION 48 POL | 786VU | 234 | | |
| 45RM1 | PC BOARD AMPLIFIER | 786VU | 234 | | |
| 47RM2 | MASTER PC BOARD, PURSER, encloses: | 786VU | 234 | | |
| 42RM2 | PC BOARD CODER | 786VU | 234 | | |
| 42RM2-1 | ADAPTER PURSER STATION 40 POL | 786VU | 234 | | |
| 43RM2 | PC BOARD CODER DECODER | 786VU | 234 | | |
| 44RM2 | PC BOARD DECODER | 786VU | 234 | | |
| 44RM2-1 | ADAPTER PURSER STATION 48 POL | 786VU | 234 | | |
| 45RM2 | PC BOARD AMPLIFIER | 786VU | 234 | | |
| 47RM6 | MASTER PC BOARD, ATTND 1R, encloses: | 786VU | 234 | | |
| 42RM6 | PC BOARD CODER | 786VU | 234 | | |
| 42RM6-1 | ADAPTER FWD ATTND STATION 40 POL | 786VU | 234 | | |
| 43RM6 | PC BOARD CODER DECODER | 786VU | 234 | | |
| 44RM6 | PC BOARD DECODER | 786VU | 234 | | |
| 44RM6-1 | ADAPTER FWD ATTND STATION 48 POL | 786VU | 234 | | |
| 45RM6 | PC BOARD AMPLIFIER | 786VU | 234 | | |
| 48RM | MASTER PC-BOARD, ATTND 2 L/R encloses: | 787VU | 244 | | |
| 42RM | PC BOARD CODER | 787VU | 244 | | |
| 42RM-1 | ADAPTER EMER EXIT STATION 40 POL | 787VU | 244 | | |
| 43RM | PC BOARD CODER DECODER | 787VU | 244 | | |
| 44RM | PC BOARD DECODER | 787VU | 244 | | |
| 44RM-1 | ADAPTER EMER EXIT STATION 48 POL | 787VU | 244 | | |
| 45RM | PC BOARD AMPLIFIER | 787VU | 244 | | |
| 46RM | PC BOARD CLOCK GENERATOR | 787VU | 244 | | |
| 47RM3 | MASTER PC-BOARD, AFT ATTEND 3 L/R encloses: | 788VU | 263 | | |
| 42RM3 | PC BOARD CODER | 788VU | 263 | | |
| 42RM3-1 | ADAPTER AFT ATTEND STATION 40 POL | 788VU | 263 | | |
| 43RM3 | PC BOARD CODER DECODER | 788VU | 263 | | |
| 44RM3 | PC BOARD DECODER | 788VU | 263 | | |
| 44RM3-1 | ADAPTER AFT ATTND STATION 48 POL | 788VU | 263 | | |

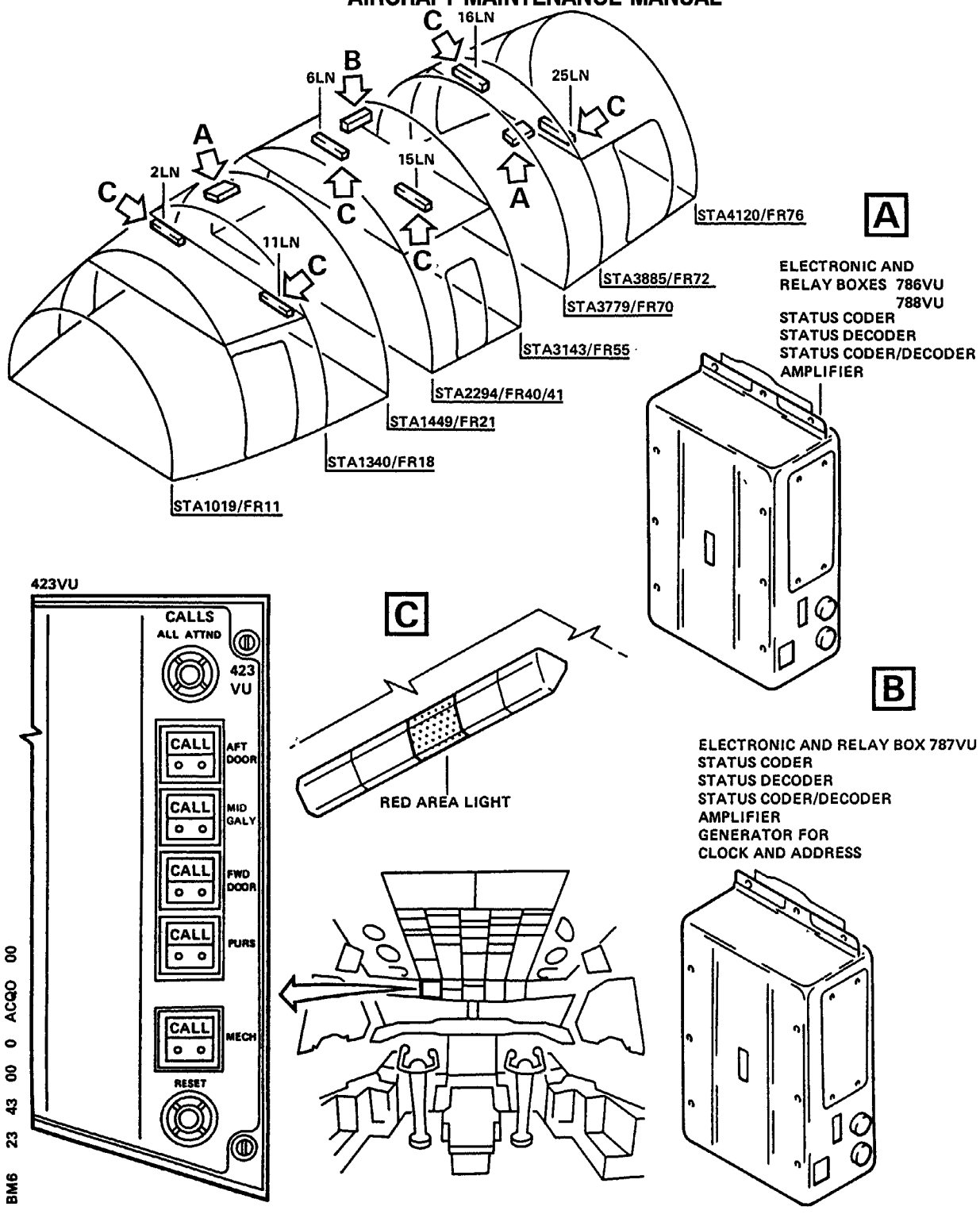
| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 45RM3 | PC BOARD AMPLIFIER | 788VU | 263 | | |
| 92RM | KEYBOARD-RH FWD ATTN STATION | 784VU | 222 | | |
| 2LN | LIGHT PANEL-AREA | | 224 | | 33-23-11 |
| 6LN | LIGHT PANEL-AREA | | 234 | | 33-23-11 |
| 11LN | LIGHT PANEL-AREA | | 223 | | 33-23-11 |
| 15LN | LIGHT PANEL-AREA | | 233 | | 33-23-11 |
| 16LN | LIGHT PANEL-AREA | 840VU | 254 | | 33-23-11 |
| 25LN | LIGHT PANEL-AREA | 841VU | 253 | | 33-23-11 |
| 50LN | LIGHT PANEL-AREA | | 260 | | 33-23-11 |



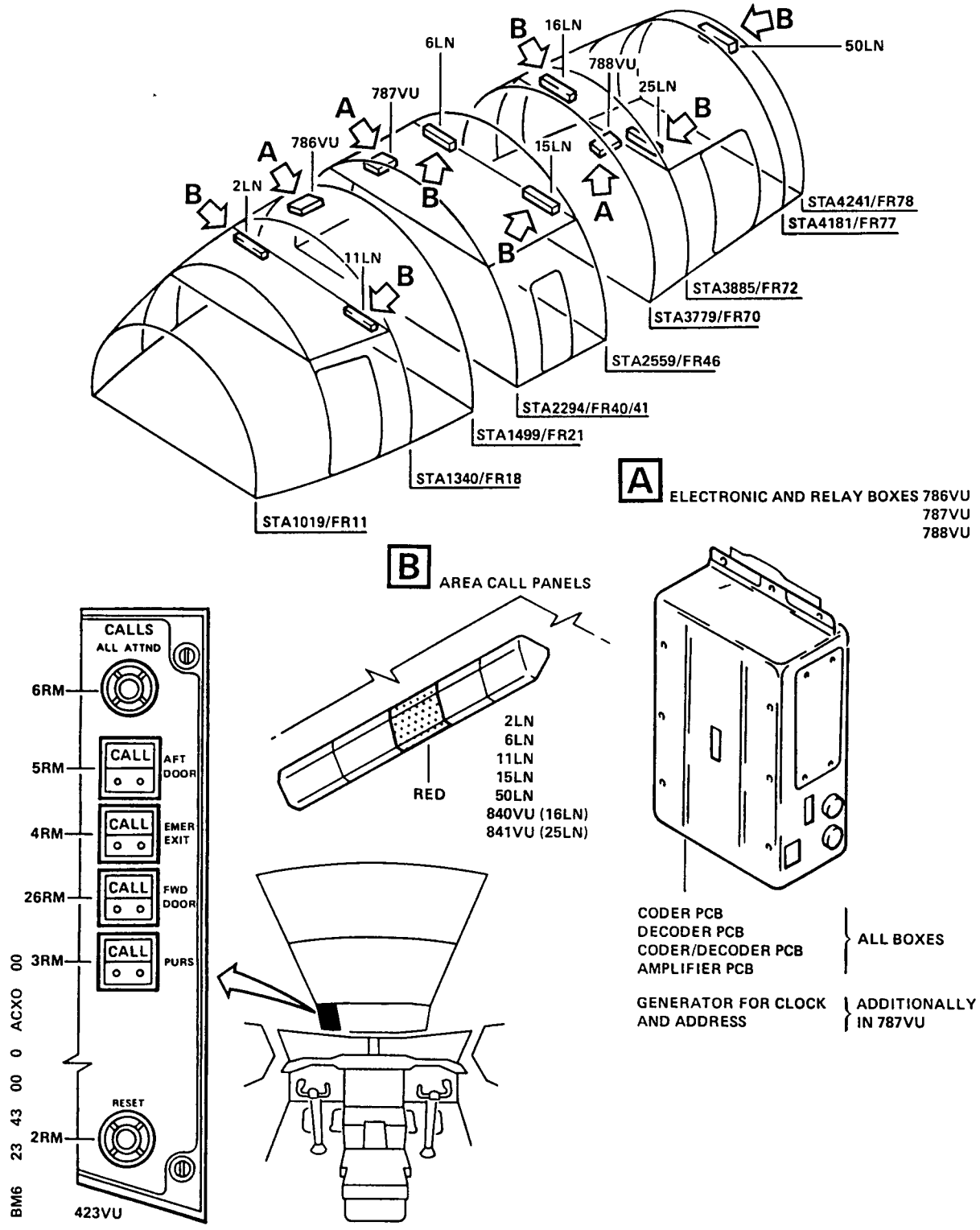

TYPICAL CONFIGURATION OF ATTENDANT STATIONS

BM6 23 43 00 0 AAAO 00

Cabin and Flight Crew Call System Block Diagram
Figure 001

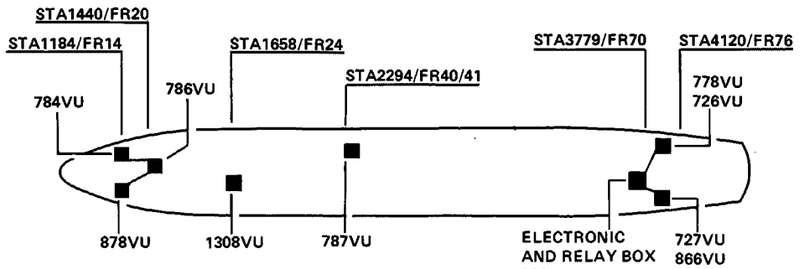


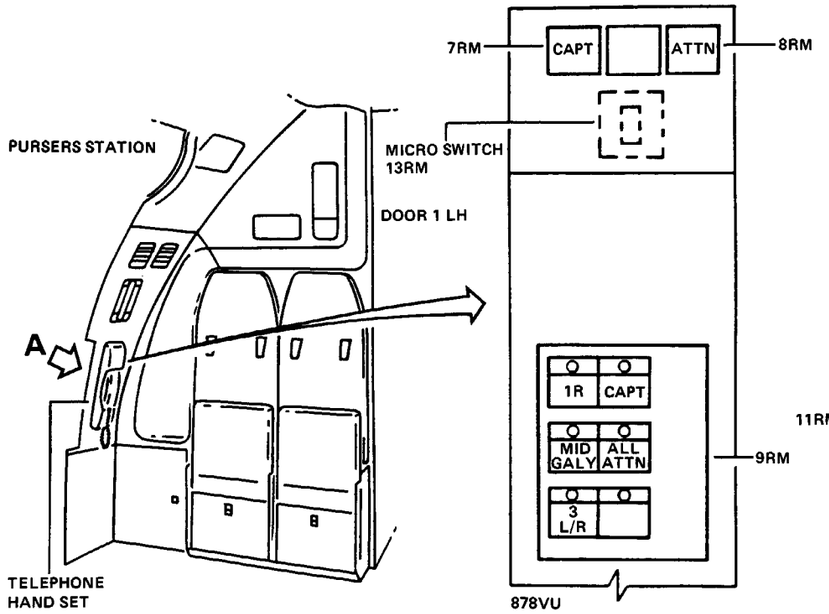

Cabin and Flight Crew Call System
Component Location
Figure 002



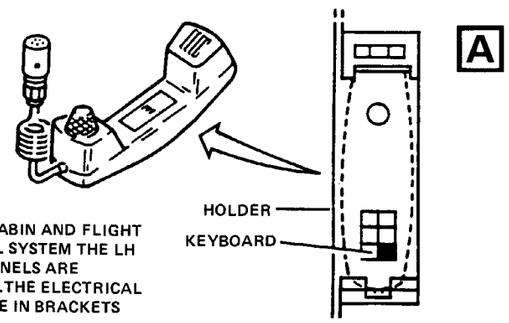

Cabin and Flight Crew Call System
Component Location
Figure 003

R

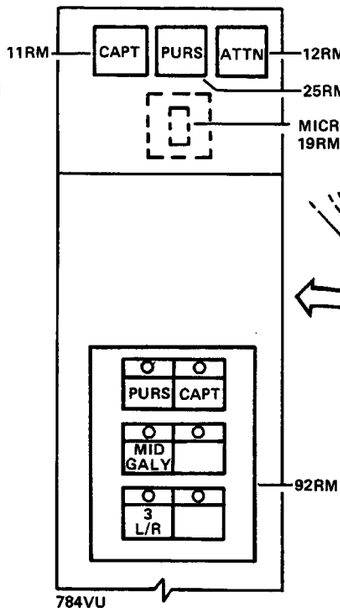


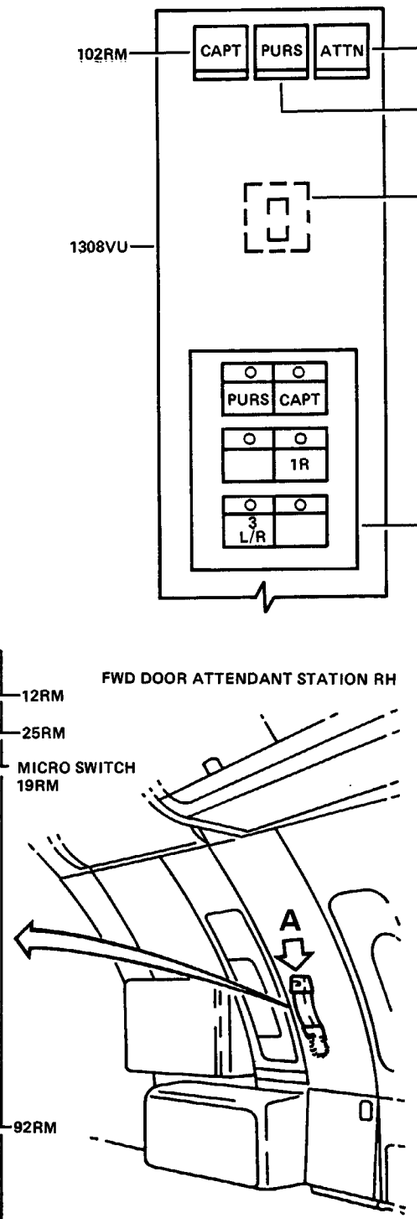

TYPICAL HANDSET AND HOLDER

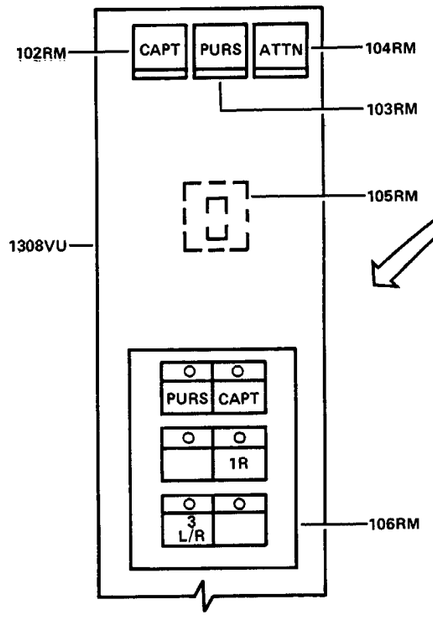


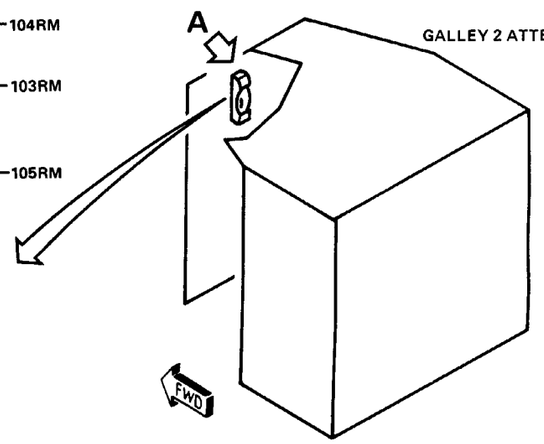

NOTE: FOR THE CABIN AND FLIGHT CREW CALL SYSTEM THE LH AND RH PANELS ARE IDENTICAL. THE ELECTRICAL IDENTS ARE IN BRACKETS



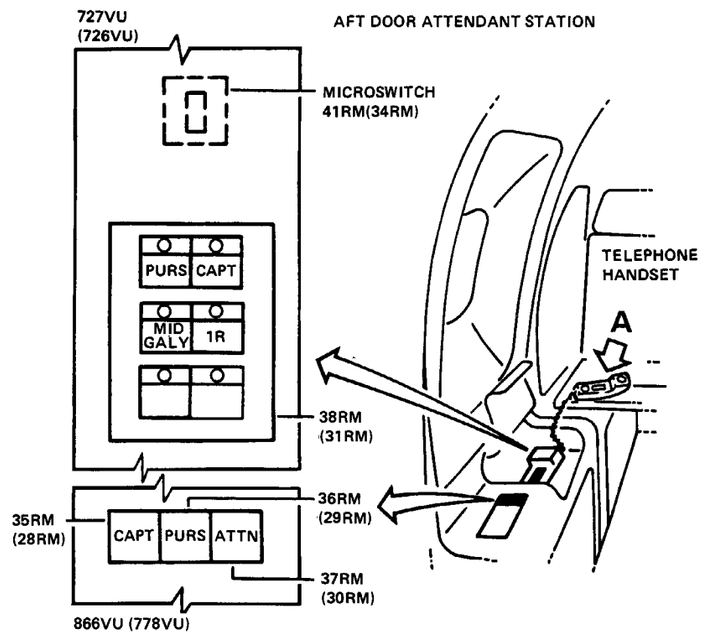

FWD DOOR ATTENDANT STATION RH



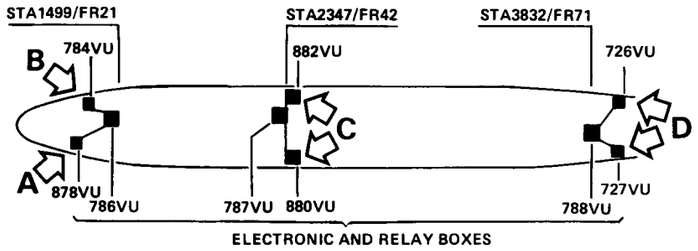



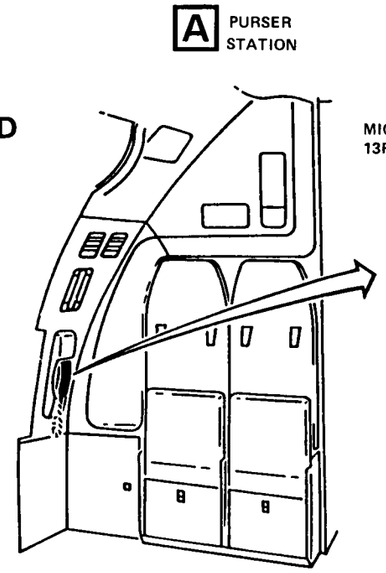

AFT DOOR ATTENDANT STATION

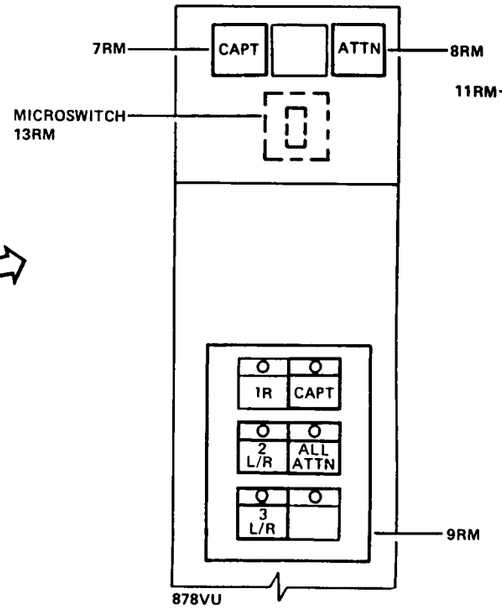


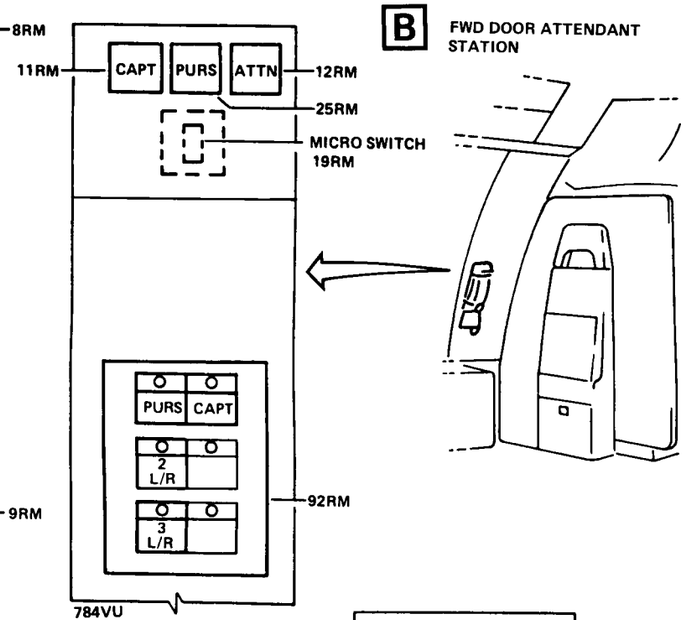

BM6 23 43 00 0 AGMO 00

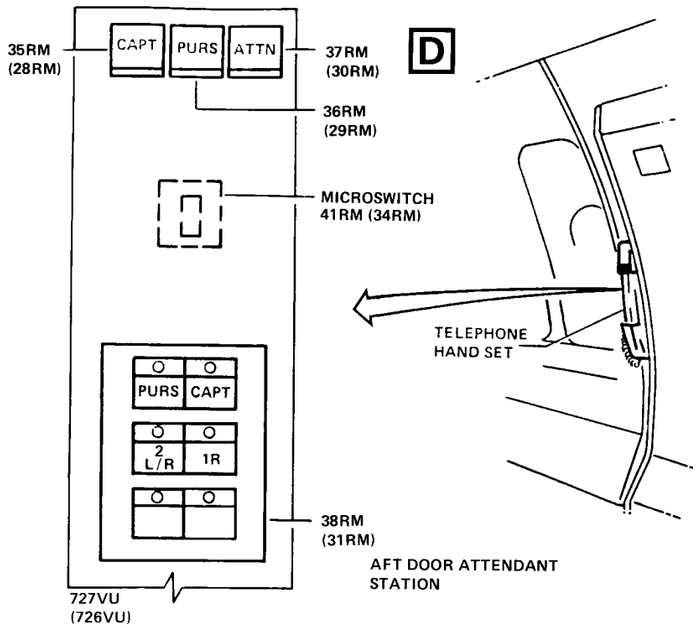
Cabin and Flight Crew Call System
Component Location in Cabin
Figure 004

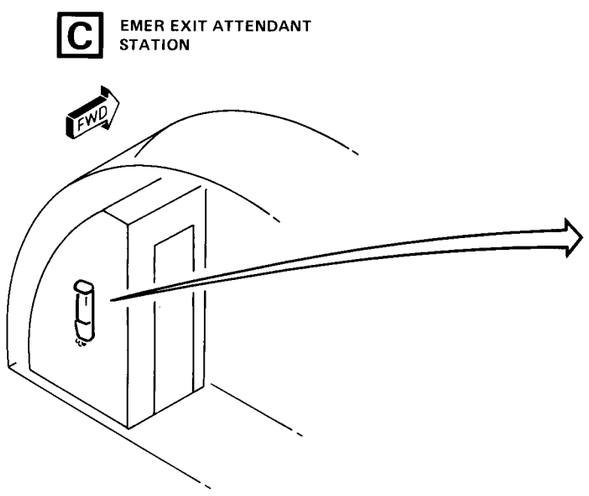


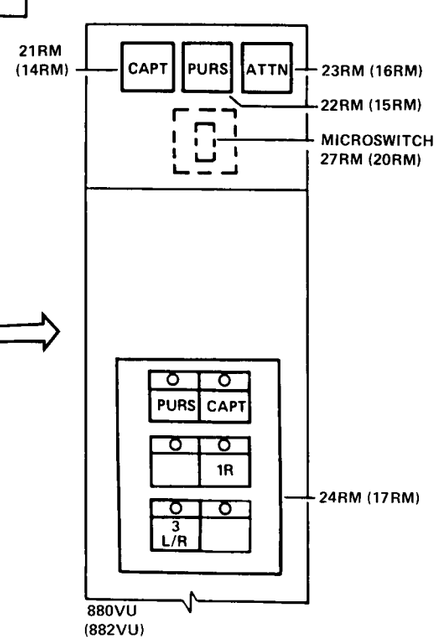




NOTE:
WHERE THE RH ATTENDANT PANELS ARE NOT SHOWN THEY ARE SIMILAR TO THE LH PANEL AT THE OPPOSITE DOOR. THE RH PANEL NUMBER AND FIN ARE SHOWN IN BRACKETS.

BM6 23 43 00 0 AGXO 00

Cabin and Flight Crew Call System
Component Location in Cabin
Figure 005

R **ON A/C ALL

3. System Description

A. The system provides the means by which the cabin and flight crew may attract each others attention. The 'attention getters' consist of call lights, pushbutton switches with integral lights, red area lights and a HI/LO tone chime broadcast over the PA system.
Each of the cabin crew has a telephone handset station containing pushbutton switches with integral light emitting diodes (LEDS), which indicate that a particular station is busy.

R **ON A/C 001-100,

(1) The captain's call panel provides the facility to separately call: the purser, the fwd attendant station RH, the mid galley attendant station, the aft attendant stations (simultaneously), or all the stations simultaneously (urgent call). Each of the pushbutton switches contain an integral light. The light, colored blue, comes on when the captain is being called. The captain can cancel any call which he has initiated by pressing the RE-SET pushbutton switch.

R **ON A/C 101-200,

R (1) The captain's call panel provides the facility to separately call: the
R purser, the fwd attendant station RH, the emer exit attendant stations
R (simultaneously), the aft attendant stations (simultaneously), or all
R the stations simultaneously (urgent call). The call for each attendant
R station can be repeated as often as possible. Each of the pushbutton
R switches contain an integral light. The integral light comes on to indi-
R cate that the captain is being called. The captain can cancel any call
R which he has initiated by pressing the RESET pushbutton switch.

R **ON A/C 001-100,

(2) The purser's station call panel provides the facility to separately call: the captain, the fwd attendant station RH, the mid galley attendant station, the aft attendant stations (simultaneously) or all attendants simultaneously (all attendants only for purser).
The panel consists of two call lights CAPT and ATTN, mounted above the telephone handset. Under the handset are five call buttons, CAPT, 1R, MID GALY, 3 L/R and ALL ATTN, each containing a LED, which indicate when a station is 'busy'.
A handset-operated microswitch is included in the panel. The microswitch is used to switch off the associated call light when the handset is removed from its holder, and to cancel the busy indications displayed at the other stations handset panel, when the handset is replaced.

R **ON A/C 101-200,

R (2)The purser's station call panel provides the facility to separately call:
R the captain, the fwd attendant station RH, the emer exit attendant sta-
R tions (simultaneously), the aft attendant stations (simultaneously) or
R all attendants simultaneously (all attendants only for purser).
R The call for each attendant station can be repeated as often as possible
R The panel consists of two call lights CAPT and ATTN, mounted above the
R telephone handset. Under the handset are five call buttons, CAPT, 1R,
R 2 L/R, 3 L/R and ALL ATTN, each containing a LED, which indicate when a
R station is 'busy'.
R A handset-operated microswitch is included in the panel. The microswitch
R is used to switch off the associated call light when the handset is
R removed from its holder, and to cancel the busy indications displayed
R at the other stations handset panel, when the handset is replaced.

R **ON A/C 001-100,

(3)Attendant panels:
(a)An attendant call panel is installed aft of door 1 RH.
The panel provides the facility to separately call; the captain, the purser station, the mid galley attendant station and the aft attendant stations (simultaneously). The panel consists of three call lights; CAPT, PURS and ATTN mounted above the telephone handset and indicate the origin of the call. Under the handset are four call buttons,CAPT, PURS, MID GALY and 3 L/R. The function of the call buttons, the LEDs in the call buttons and the handset microswitch are identical to that of the purser's panel.
(b)An attendant call panel is installed in the center of mid galley 2. With respect to the cabin and flight crew call system, the panels are identical.The panel provides the facility to separately call; the captain, the purser, the fwd attendant RH and the two aft attendants (simultaneously). The panel consists of three call lights; CAPT, PURS and ATTN. The lights are mounted above the handset and indicate the origin of the call. Under the handset are four cabin and flight crew call buttons; CAPT, PURS, 1R and 3 L/R. The function of the call buttons, the LEDs in the call buttons and the handset microswitch are identical to that of the purser's panel.
(c)An attendant call light panel and separate handset panel are installed on the LH and RH side aft of aft passenger door. With respect to the cabin and flight call system the two installations are identical. The panels provide the facility to separately call, the captain, the purser, the fwd attendant RH and the mid galley attendant. The call light panel consists of three call lights; CAPT, PURS and ATTN. The handset panel is installed adjacent to the call light panel but is covered by a flap. Under the handset are four cabin and flight crew call buttons, CAPT, PURS, 1 R and MID GALY. The function of the call buttons, the LEDs in the call buttons and the handset microswitch are identical to that of the purser's panel.

R **ON A/C 101-200,

R (3)Attendant panels:
R (a)An attendant call panel is installed on the RH, aft of door 1 RH. The panel provides the facility to separately call: the captain, the purser, the emer exit attendant stations (simultaneously), the aft door attendant stations (simultaneously). The call for each attendant station can be repeated as often as possible. The panel consists of three call lights: CAPT, PURS and ATTN. The lights are mounted above the handset and indicate the origin of the call. Under the handset are four cabin and flight crew call buttons: CAPT, PURS, 2 L/R and 3 L/R. The function of the call buttons, the LEDs in the call buttons and the handset microswitch is similar to that of the purser's panel.
R (b)Attendant call panel are installed, one on the LH and one on the RH side of the emer exit door. With respect to the cabin and flight crew call system the two panels are similar. The panels provide the facility to separately call: the captain, the purser, the fwd door attendant station and the two aft door attendant stations (simultaneously). The call for each attendant station can be repeated as often as possible. The panels consist of three call lights: CAPT, PURS and ATTN. The lights are mounted above the handset and indicate the origin of the call. Under the handset are four cabin and flight crew call buttons: CAPT, PURS, 1 R and 3 L/R. The function of the call buttons, the LEDs in the call buttons and the handset microswitch is similar to that of the purser's panel.
R (c)Attendant call panels are installed, one on the LH and one on the RH aft of aft door. With respect to the cabin and flight crew call system, the panels are similar. The panels provide the facility to separately call: the captain, the purser, the door 1 RH attendant station and the emer exit attendant stations (simultaneously). The call for each attendant station can be repeated as often as possible. The panel consists of three call lights: CAPT, PURS and ATTN. The lights are mounted above the handset and indicate the origin of the call. Under the handset are four cabin and flight crew call buttons: CAPT, PURS, 1 R and 2 L/R. The funktion of the call buttons, the LEDs in the call buttons and the handset microswitch is identical to that of those on the purser's panel.

R **ON A/C ALL

(4)Electronic and Relay Box
Three boxes are installed, one fwd, one mid and one aft. They are electrically connected to their associated cabin and flight crew call panels. Each unit contains a master Printed Circuit Board (PCB) on which the following PCBs are connected:
- Status coder
- Status decoder
- Status coder/decoder
- Amplifier
- Clock generator (in one unit only)

(a)PCB status coder
Each unit is provided with a status coder board which is continuously interrogated by the timing signals from the clock generator to determine the condition of the various cabin and flight crew calls.

(b)PCB status decorder
Each unit is provided with a status decoder board which selects the coded digit out of the status bus and feeds this coded digit to a separate amplifier.

(c)Status coder/decoder
Each unit is provided with a status coder/decoder board which contains parts of the status coder and status decoder board.

(d)PCB amplifier
Each unit is provided with an amplifier board which contains separate amplifiers for each output, the possibility for flash light and a power supply.

(e)PCB clock generator
Only one unit is provided with a clock generator board. The clock generator provides the clock bus constant with a sine timing of 5 kHz.
A constant pulse train is delivered to the address bus consisting of: 10 times high, 3 times low, 1 time high and a 6 BIT work in binary code which counts continuously from 0 to 47. Each digit has a fixed place in the system. The pulses are in sine form.

(f)The stations are connected via 3 wire buses, for the status, address and the clock pulses.
The clock pulses are used for synchronization of all units with a timing of 5 kHz. The address pulses are sent in series to all units and the status pulses transmit information from unit to unit.
Each signal is transmitted in digits in binary code.
The unit which contains the clock generator board transmits the signals to the clock and address buses.
The status coder and status decoder are equipped with an interchangeable adapter to provide the appropriate code for the respective attendant station.
The timing signals of the clock generator are necessary so that all attendant stations work simultaneously.
The signal from a pressed call button is coded by the status coder. All status decoders decode this information and initiate the outputs via the amplifier.
The unit also controls the output to the red area lights, and provides the signal to the PA amplifier which produces the HI/LO chime, for the attendant speakers or both cabin and attendant speakers.
The unit also receives signals from the passenger attendant call system and provides the output to energize the attendant speakers relay.

R **ON A/C 001-100,

(5)Six area light panels are installed in the passenger compartment.
Each contains a red lamp, which comes on when the 'ALL ATTEND' call pushbutton on the captain's call panel is pressed.

R **ON A/C 101-200,

(5)Seven area light panels are installed in the passenger compartment. Each contains a red lamp, which comes on when the 'ALL ATTEND' call pushbutton on the captain's call panel is pressed.

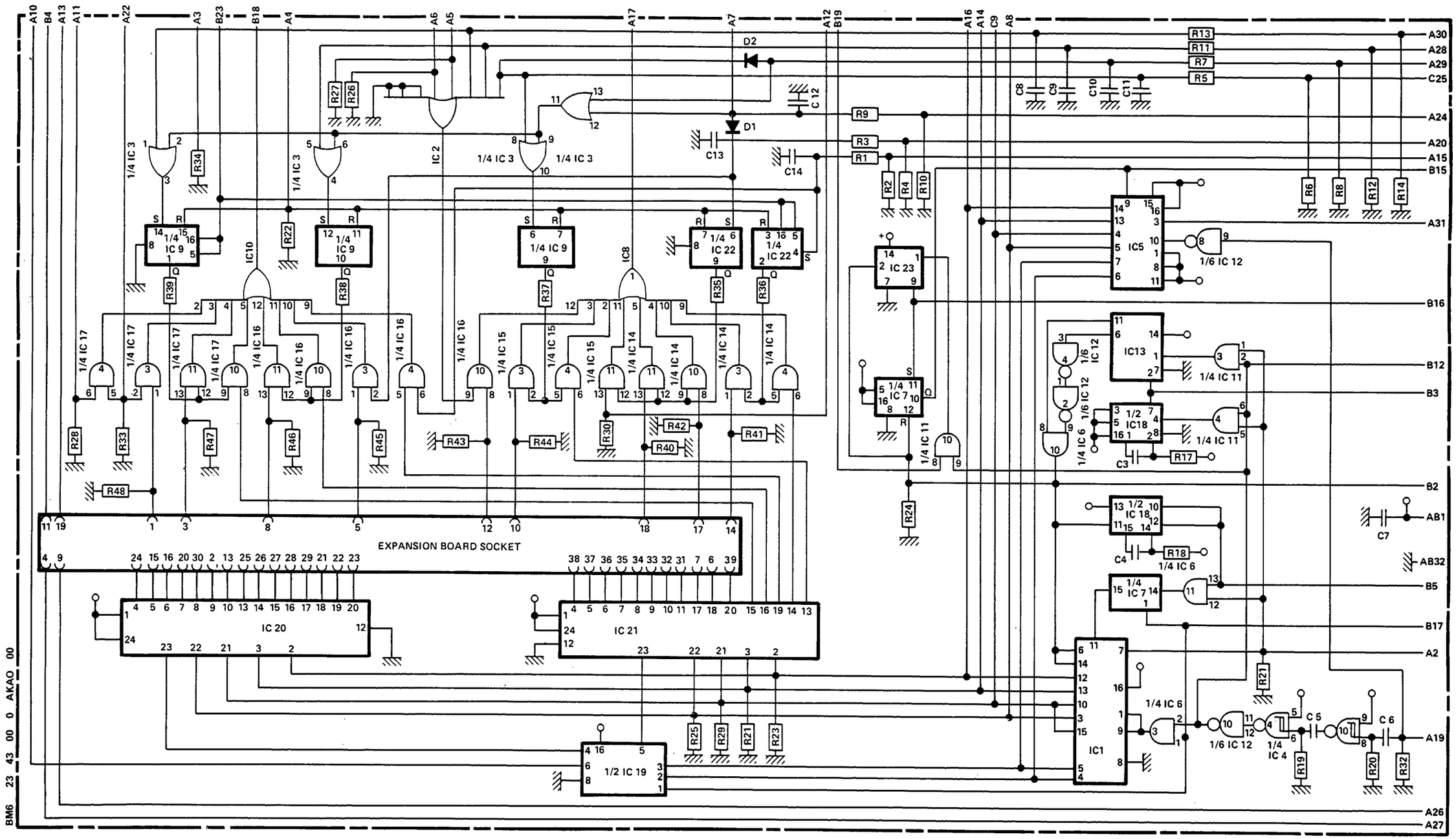
R **ON A/C ALL

(Ref. Fig. 006)
(Ref. Fig. 007)
(Ref. Fig. 008)
(Ref. Fig. 009)
(Ref. Fig. 010)

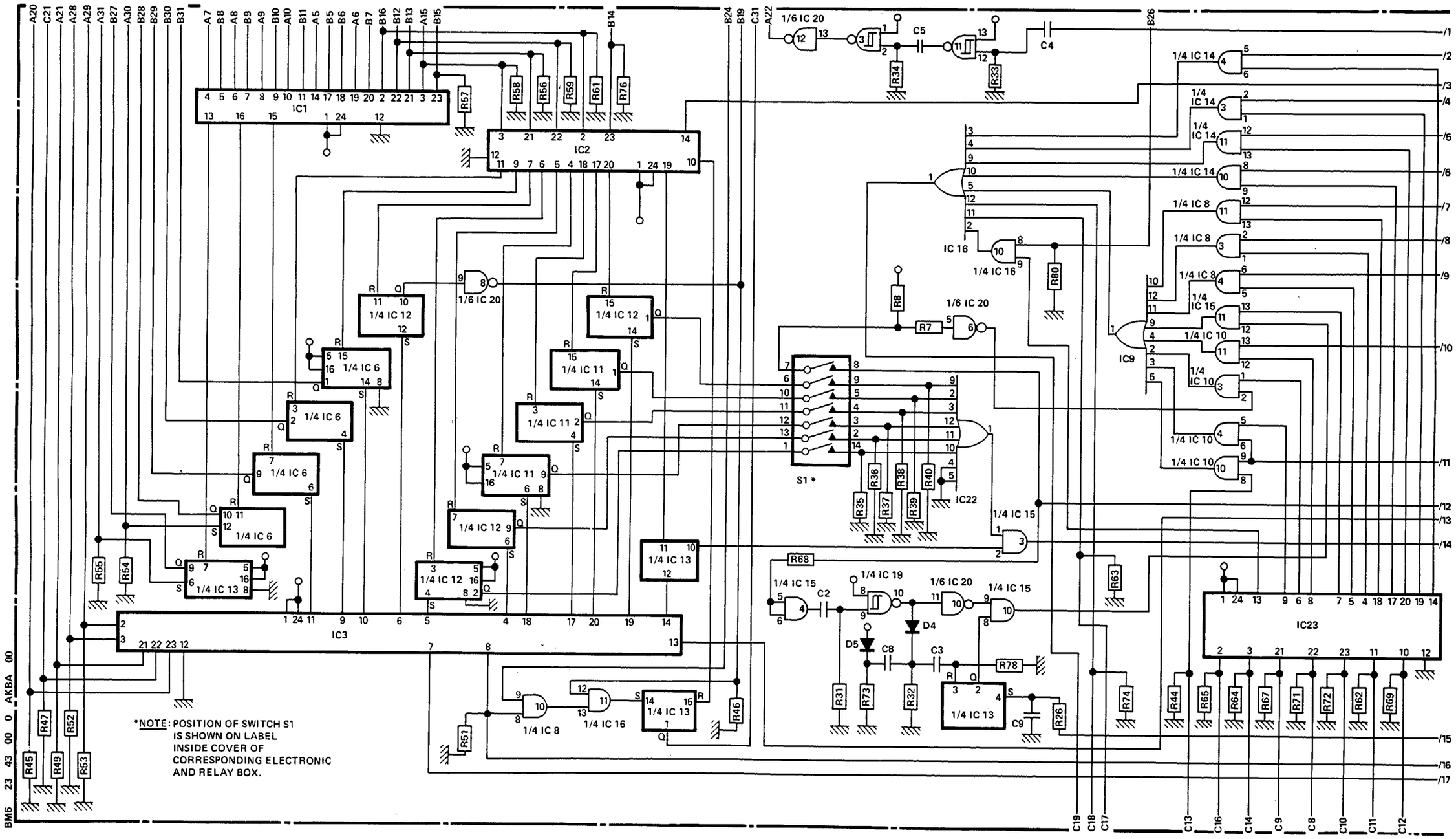
R **ON A/C 001-100,

A. With busbar 301PP energized, 28 V DC power is supplied via circuit breaker CALL CABIN to the flight compartment call panel and to the electronic and relay boxes. When a call is initiated the following occurs:
(1)Captain to Purser Call
(a)Captain presses PURS CALL pushbutton and a 28 V DC signal is transmitted to the electronic and relay box.
(b)The electronic and relay box initiates the following:
- Switches on the CAPT call light on the purser station handset panel.
- Switches on the LEDs in the PURS pushbuttons at all stations.
- Transmits a signal to the PA amplifier, and a HI/LO tone chime is broadcast over the attendant and cabin speakers.
(c)The purser lifts the handset, the panel microswitch operates and completes the ground signal for the electronic relay box, which switches off the CAPT call light.
(d)The purser replaces the handset and the microswitch operates to remove the ground signal. The LEDs in the PURS pushbuttons go off.
(e)If the captain presses the RESET pushbutton, before a call is terminated, a 28 V DC signal is transmitted to the electronic and relay box and the call is cancelled.
(2)Captain to all stations (Urgent Call)
(a)Captain presses ALL ATTND call pushbutton and a 28 V DC signal is transmitted to the electronic and relay box.
(b)The electronic and relay box initiates the following:
- Cancels calls currently being made.
- Switches on the CAPT call light at all stations.
- Switches on the LEDs in all call pushbuttons except for the CAPT pushbuttons.
- Transmits a signal to the PA amplifier which broadcast a HI/LO tone chime over the cabin and attendant speakers.
- In all area panels, the red lamp comes on.
(c)When any handset is lifted the associated CAPT call light and all red area panel lights go off.
(d)When the handset is replaced the call is cancelled.

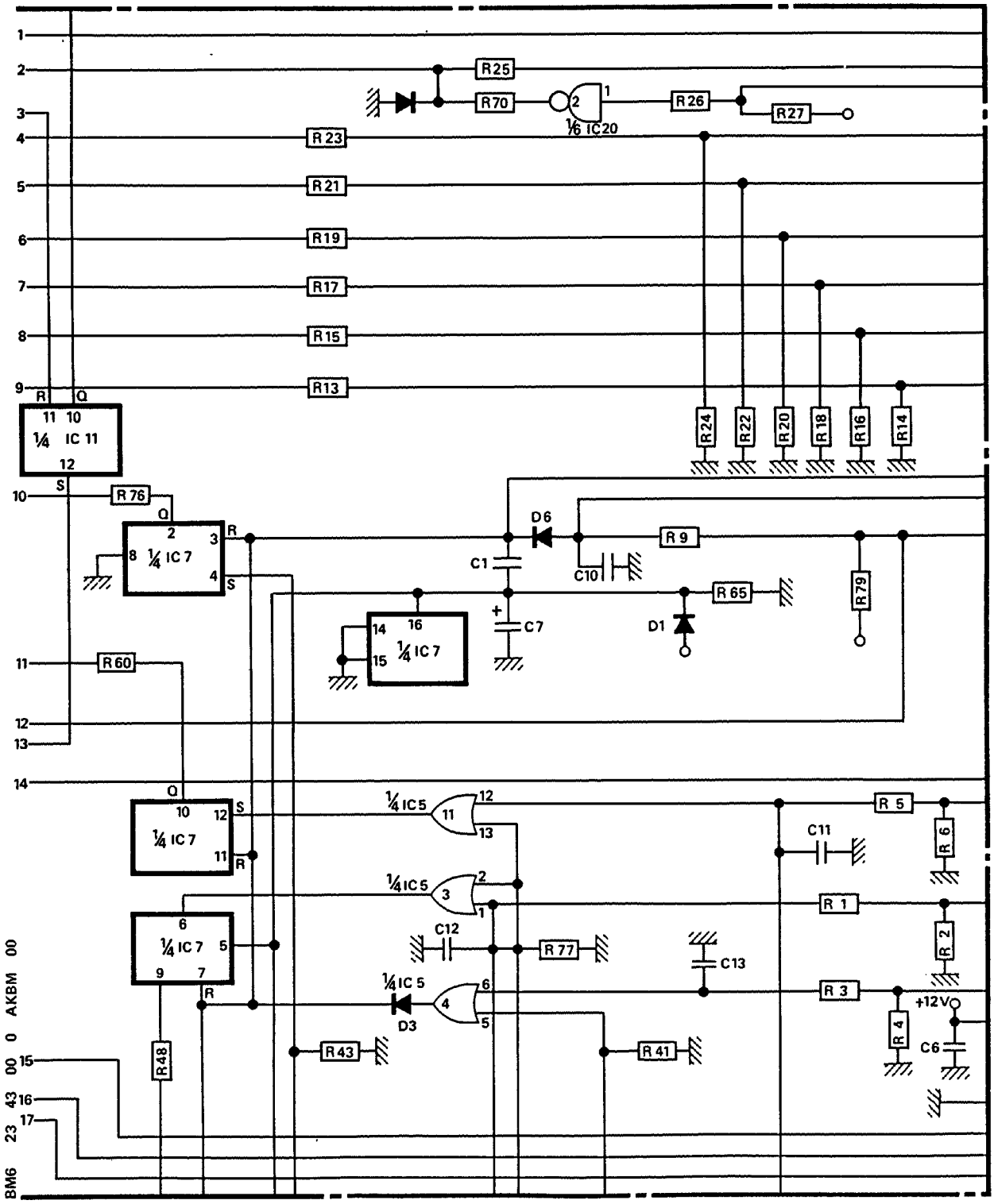
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P.C.B. Status Coder
Figure 006

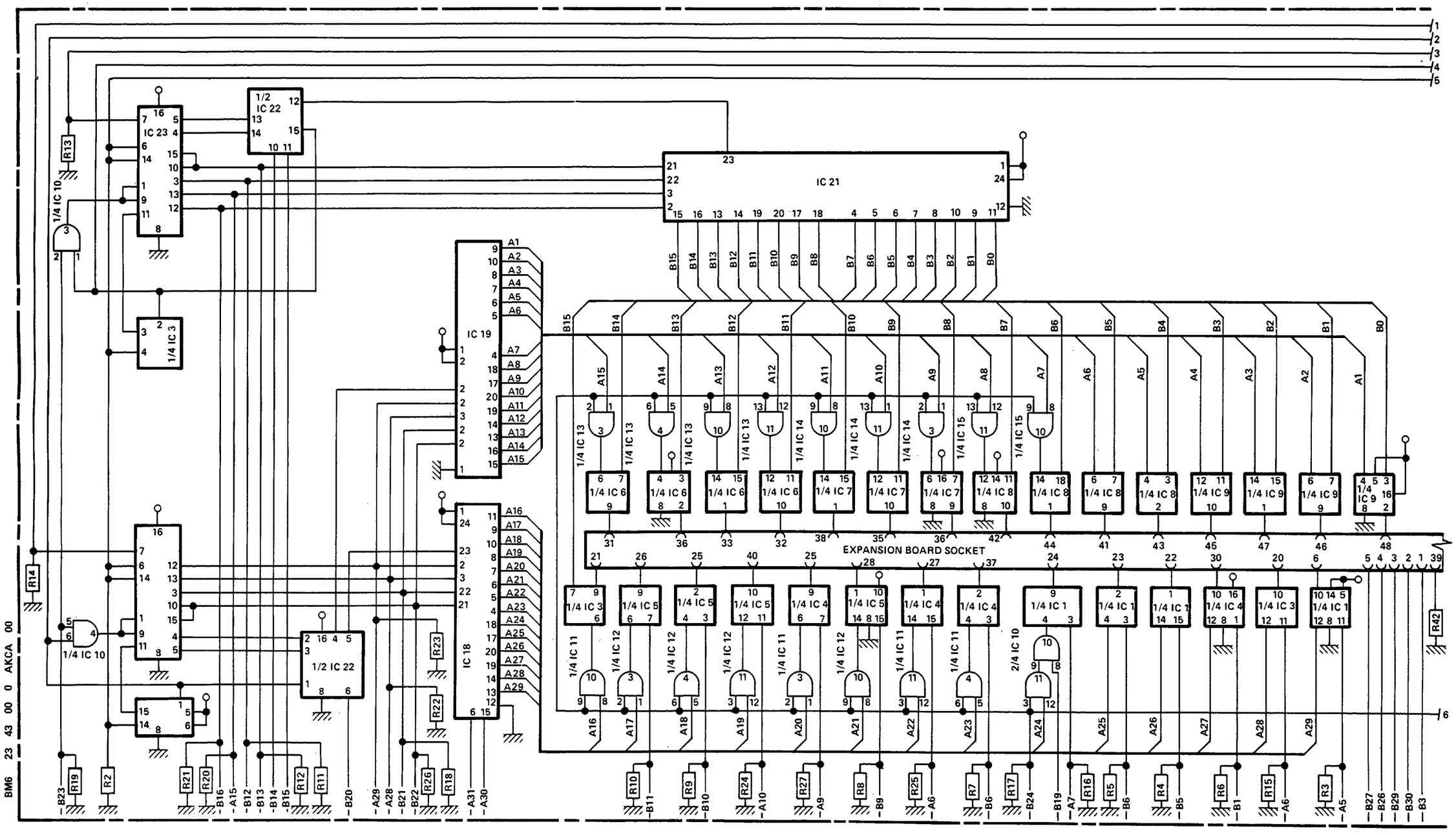



P.C.B. Status Coder/Decoder (Sheet 1/2)
Figure 007

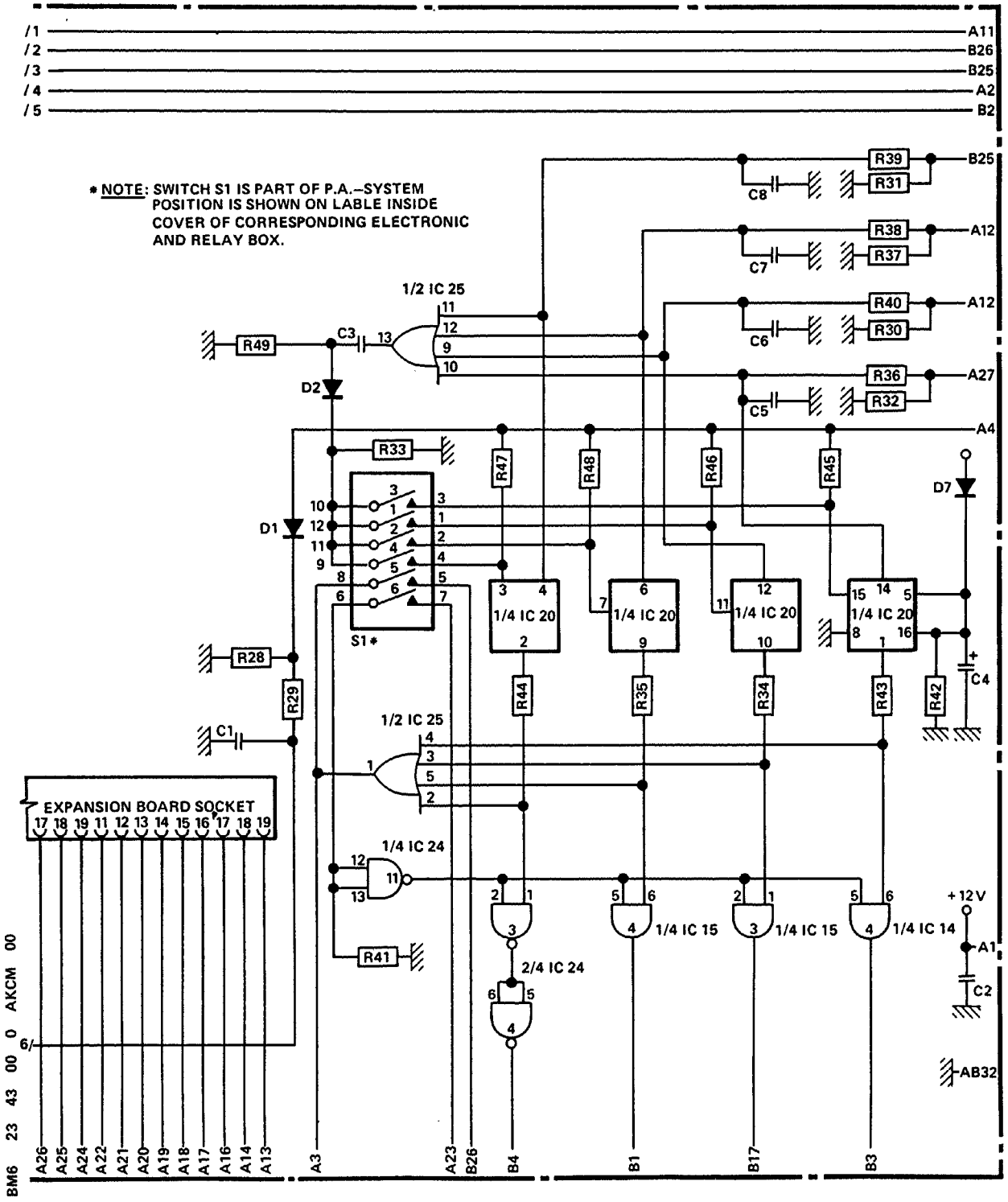



P.C.B. Status Coder/Decoder (Sheet 2/2)
Figure 007

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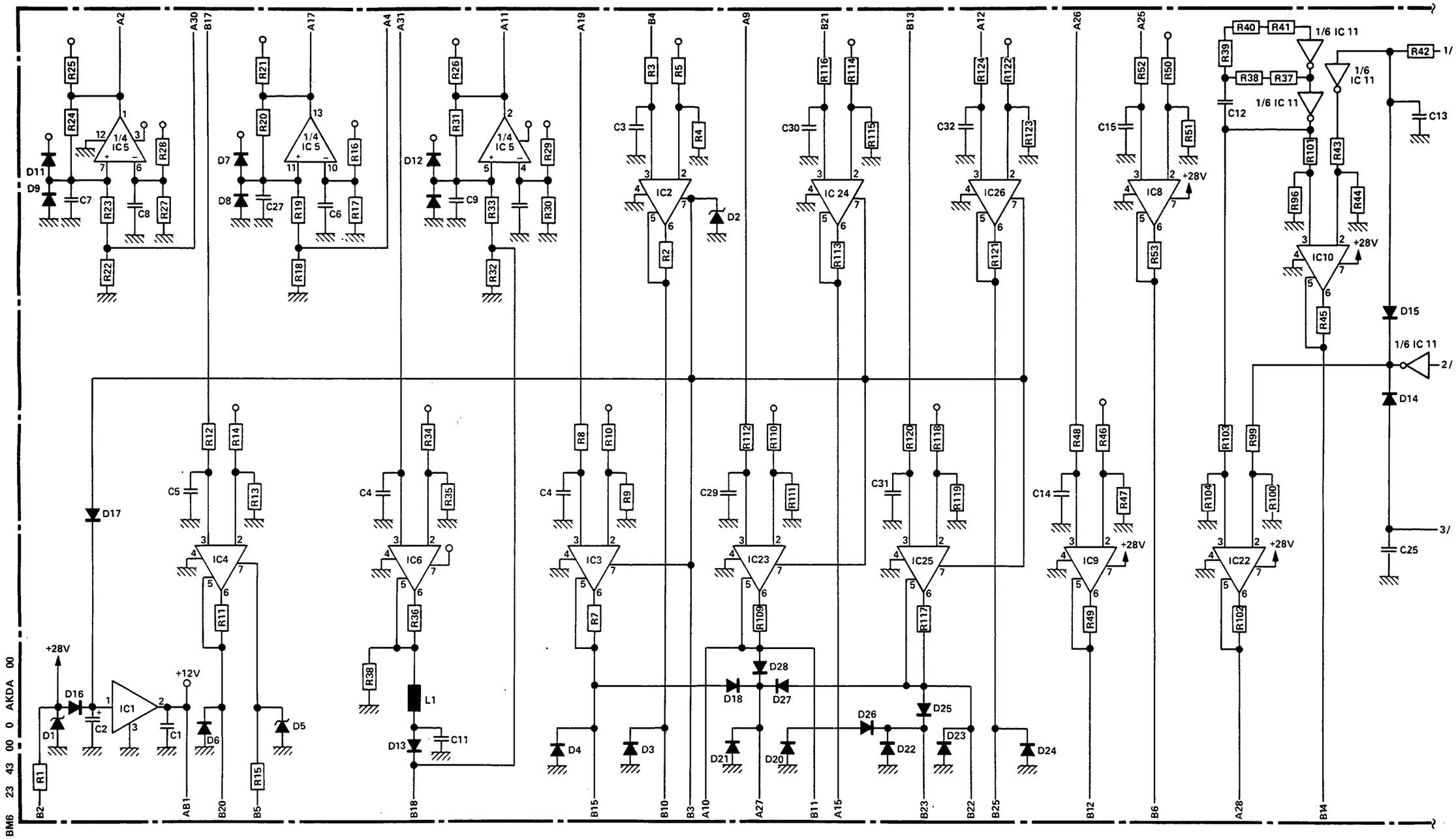



P.C.B. Status Decoder (Sheet 1/2)
Figure 008

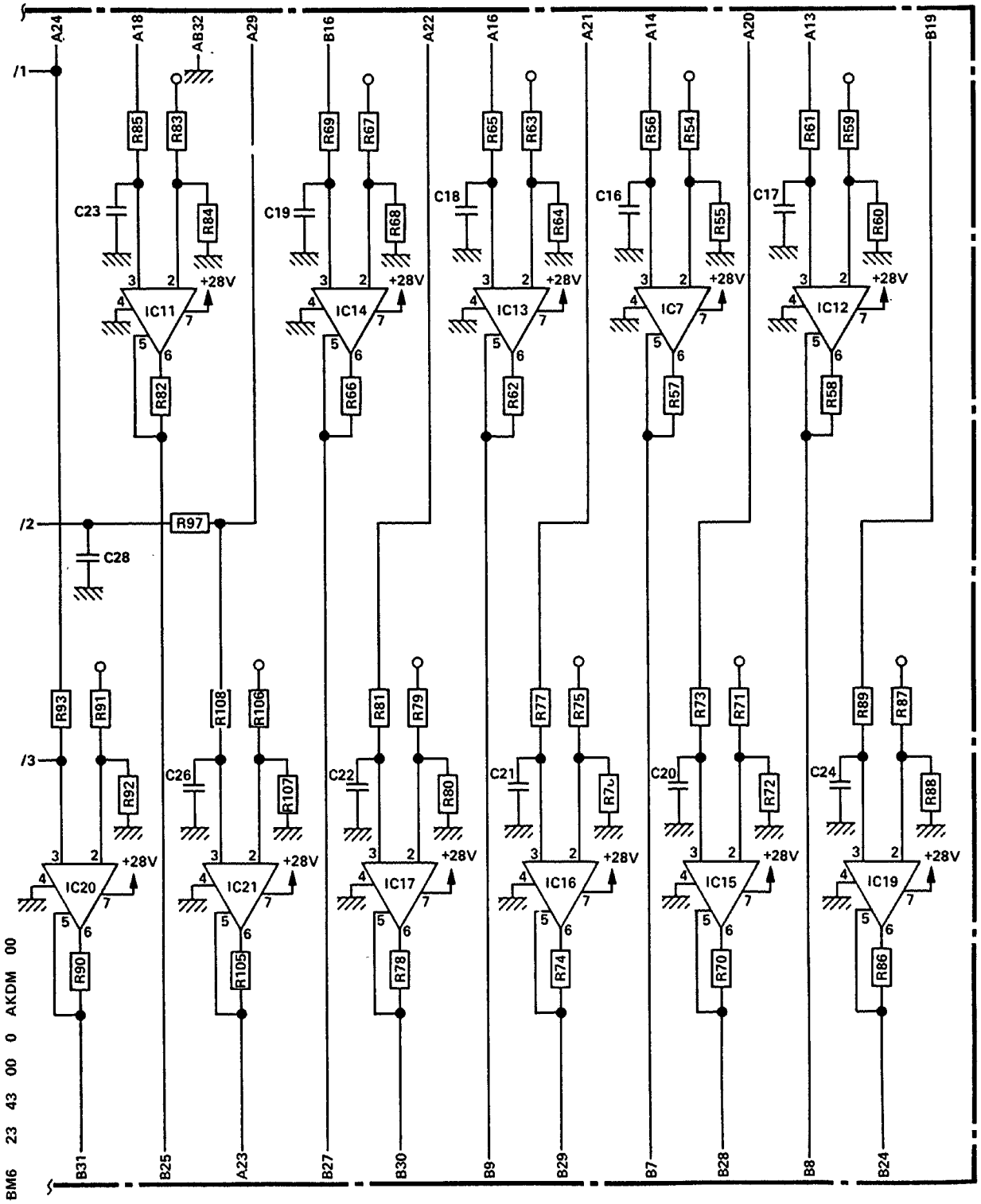



P.C.B. Status Decoder (Sheet 2/2)
Figure 008

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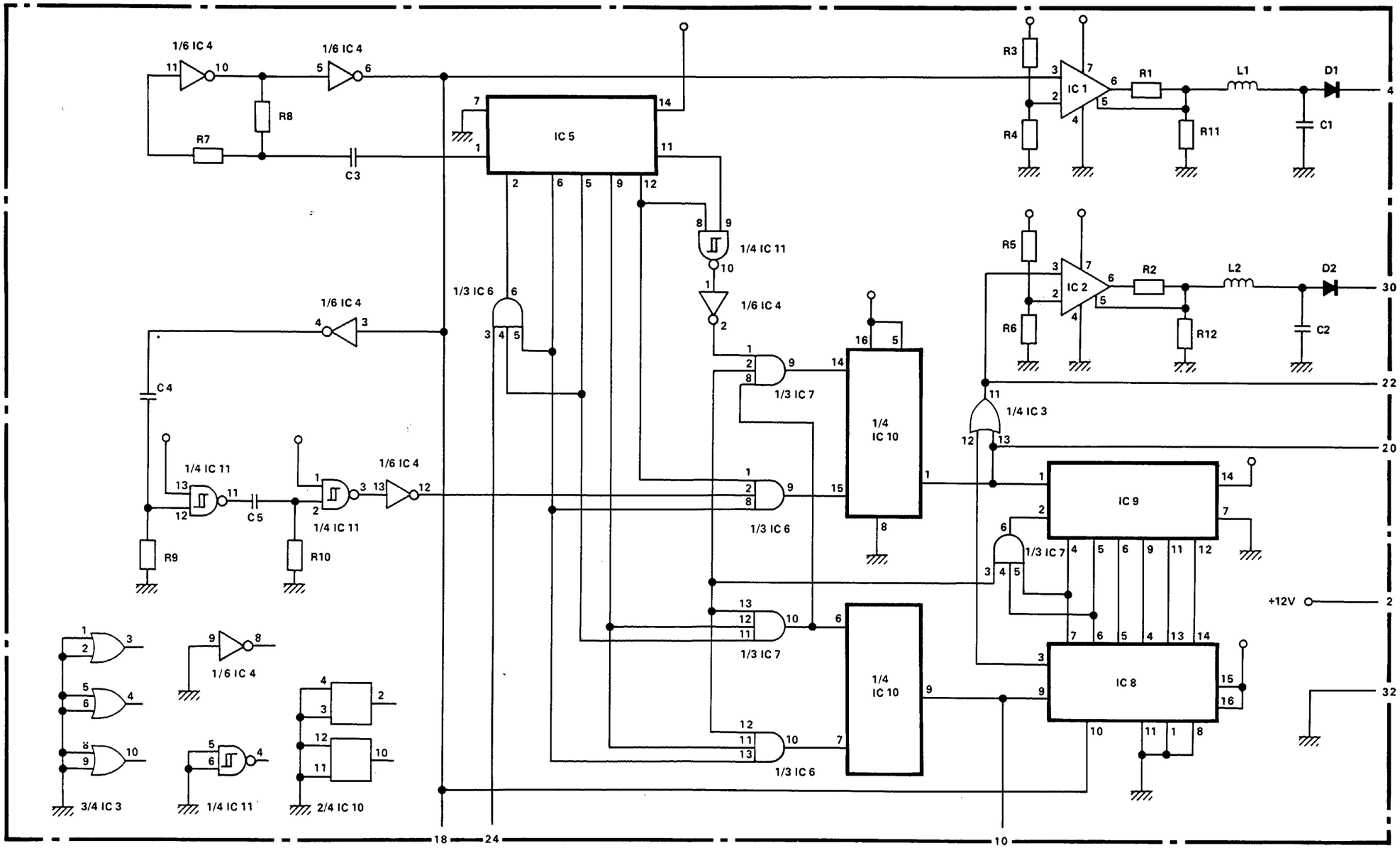



P.C.B. Amplifier (Sheet 1/2)
Figure 009




P.C.B. Amplifier (Sheet 2/2)
Figure 009

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BM6 23 43 00 0 AKE0 00

P.C.B. Clock Generator
Figure 010

EFFECTIVITY: ALL

R

PIA

Printed in France

(3)Captain to any Attendant Station
(a)Captain presses any attendant station call pushbutton and a 28 V DC signal is transmitted to the electronic and relay box.
(b)The electronic and relay box initiates the following:
- Switches on the CAPT call light on the respective attendant station.
- Switches on the LED'S from the respective station, in all stations.
- Transmits a signal to the PA amplifier, and a HI/LO tone chime is broadcast over the attendant speakers only.
(c)The attendant lifts the handset, the panel microwitch operates and completes the ground signal for the electronic and relay box, which switches off the CAPT call light.
(d)The attendant replaces the handset and the microwitch operates to remove the ground signal. The LEDs in the respective attendant pushbuttons go off.

**ON A/C 101-200,

R 4. Operation

A. With busbar 301PP energized, 28 V DC power is supplied via circuit breaker CALL CABIN to the flight compartment call panel and to the electronic and relay boxes. When a call is initiated the following occurs:
(1)Captain to Purser Call
(a)Captain presses PURS CALL pushbutton and a 28 V DC signal is transmitted to the electronic and relay box.
(b)The electronic and relay box initiates the following:
- Switches on the CAPT call light on the purser station handset panel.
- Switches on the LEDs in the PURS pushbuttons at all stations.
- Transmits a signal to the PA amplifier, and a HI/LO tone chime is broadcast over the attendant and cabin speakers.
- The call for purser station can be repeated as often as possible.
(c)The purser lifts the handset, the panel microswitch operates and completes the ground signal for the electronic relay box, which switches off the CAPT call light.
(d)The purser replaces the handset and the microswitch operates to remove the ground signal. The LEDs in the PURS pushbuttons go off.
(e)If the captain presses the RESET pushbutton, before a call is terminated, a 28 V DC signal is transmitted to the electronic and relay box and the call is cancelled.
(2)Captain to all stations (Urgent Call)
(a)Captain presses ALL ATTND call pushbutton and a 28 V DC signal is transmitted to the electronic and relay box.
(b)The electronic and relay box initiates the following:
- Cancels calls currently being made.
- Switches on the CAPT call light at all stations.
- Switches on the LEDs in all call pushbuttons except for the CAPT pushbuttons.
- Transmits a signal to the PA amplifier which broadcast a HI/LO tone chime over the cabin and attendant speakers.
- The HI/LO tone chime for all cabin and attendant speakers can be re-

peated as often as possible.
- In all area panels, the red lamp comes on.

(c)When any handset is lifted the associated CAPT call light and all red area panel lights go off.
(d)When the handset is replaced the call is cancelled.

(3)Captain to any Attendant Station
(a)Captain presses any attendant station call pushbutton and a 28 V DC signal is transmitted to the electronic and relay box.
(b)The electronic and relay box initiates the following:
- Switches on the CAPT call light on the respective attendant station.
- Switches on the LED'S from the respective station, in all stations.
- Transmits a signal to the PA amplifier, and a HI/LO tone chime is broadcast over the attendant speakers only.

The call for attendant stations can be repeated as often as possible.
(c)The attendant lifts the handset, the panel microswitch operates and completes the ground signal for the electronic and relay box, which switches off the CAPT call light.
(d)The attendant replaces the handset and the microswitch operates to remove the ground signal. The LEDs in the respective attendant pushbuttons go off.

**ON A/C 001-100,

(4)Purser to Captain
(a)Purser lifts handset and presses the CAPT pushbutton switch and a 28 V DC signal is transmitted to the electronic and relay box.
(b)The electronic and relay box initiates the following:
- Switches on the PURSER CALL pushbutton integral light on the Captain's call panel.
- Switches on the LEDs in all CAPT pushbuttons.
- Switches on a buzzer in the flight compartment.

(c)Purser replaces handset to terminate the call.

(5)Purser to one attendant station
(a)Purser lifts handset and presses the required attendant call push-button.
(b)The electronic and relay box initiates the following:
- Switches on the PURS call light at the called station.
- Switches on the busy lights in the not called station pushbuttons.
- Transmits a signal to the PA amplifier and a HI/LO tone chime is broadcast over the cabin and attendant stations loudspeakers.

(c)The called station attendant lifts the handset and the PURS call light goes off.
(d)When handsets are replaced the call is terminated.

(6)Purser to all attendants
(a)Purser lifts handset and presses the ALL ATTN call pushbutton.
(b)The electronic and relay box initiates the following:
- Switches on the PURS call light at all attendant stations.
- Switches on the LEDs in all call pushbuttons at the called attendant stations, except the PURS call pushbutton.
- Transmits a signal to the PA amplifier and a HI/LO tone chime is broadcast over the cabin and attendant stations loudspeakers.

(c)When any attendant lifts the handset the PURS call lights go off.
(d)When the handsets are replaced the call is terminated.
(7)Attendant to Captain is as described in 4.A.(4) except for the flight compartment call panel indication.
(8)Attendant to Purser and Attendant to Attendant is as described in 4.A.(5) except for handset panel indications.

**ON A/C 101-200,

(4)Purser to Captain
(a)Purser lifts handset and presses the CAPT pushbutton switch and a 28 V DC signal is transmitted to the electronic and relay box.
(b)The electronic and relay box initiates the following:
- Switches on the PURSER CALL pushbutton integral light on the Captain's call panel.
- Switches on the LEDs in all CAPT pushbuttons.
- Switches on a buzzer in the flight compartment.

The call for captain can be repeated as often as possible
(c)Purser replaces handset to terminate the call.
(5)Purser to any attendant station
(a)Purser lifts handset and presses the required attendant call push-button.
(b)The electronic and relay box initiates the following:
- Switches on the PURS call light at the called station.
- Switches on the busy lights in the not called station pushbuttons.
- Transmits a signal to the PA amplifier and a HI/LO tone chime is broadcast over the cabin and attendant stations loudspeakers.

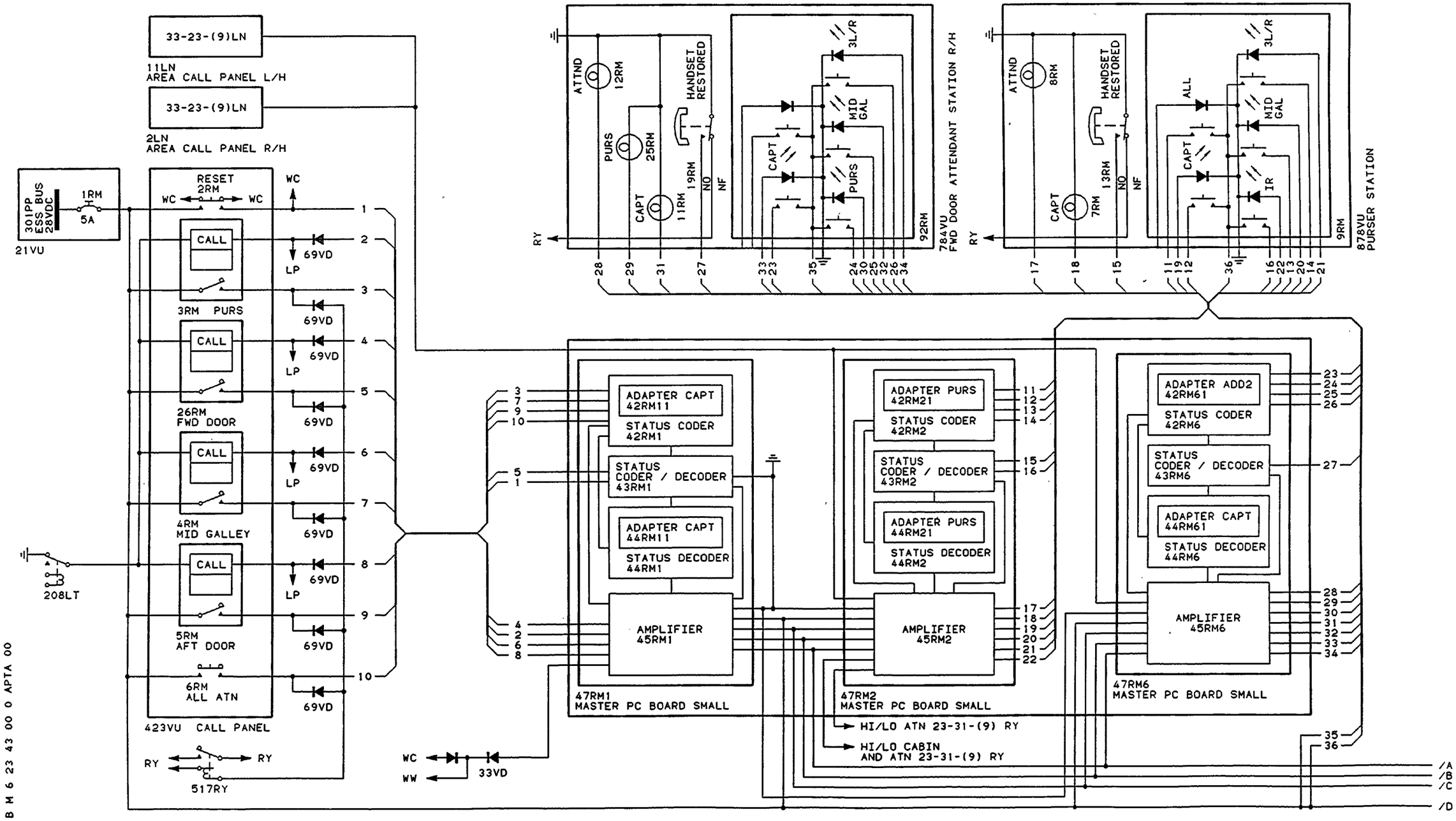
The call for any attendant station can be repeated as often as possible
(c)The called station attendant lifts the handset and the PURS call light goes off.
(d)When handsets are replaced the call is terminated.
(6)Purser to all attendants
(a)Purser lifts handset and presses the ALL ATTN call pushbutton.
(b)The electronic and relay box initiates the following:
- Switches on the PURS call light at all attendant stations.
- Switches on the LEDs in all call pushbuttons at the called attendant stations, except the PURS call pushbutton.
- Transmits a signal to the PA amplifier and a HI/LO tone chime is broadcast over the cabin and attendant stations loudspeakers.

The call for ALL ATTND can be repeated as often as possible
(c)When any attendant lifts the handset the PURS call lights go off.
(d)When the handsets are replaced the call is terminated.
(7)Attendant to Captain is as described in 4.A.(4) except for the flight compartment call panel indication.
(8)Attendant to Purser and Attendant to Attendant is as described in 4.A.(5) except for handset panel indications.

**ON A/C 001-100,

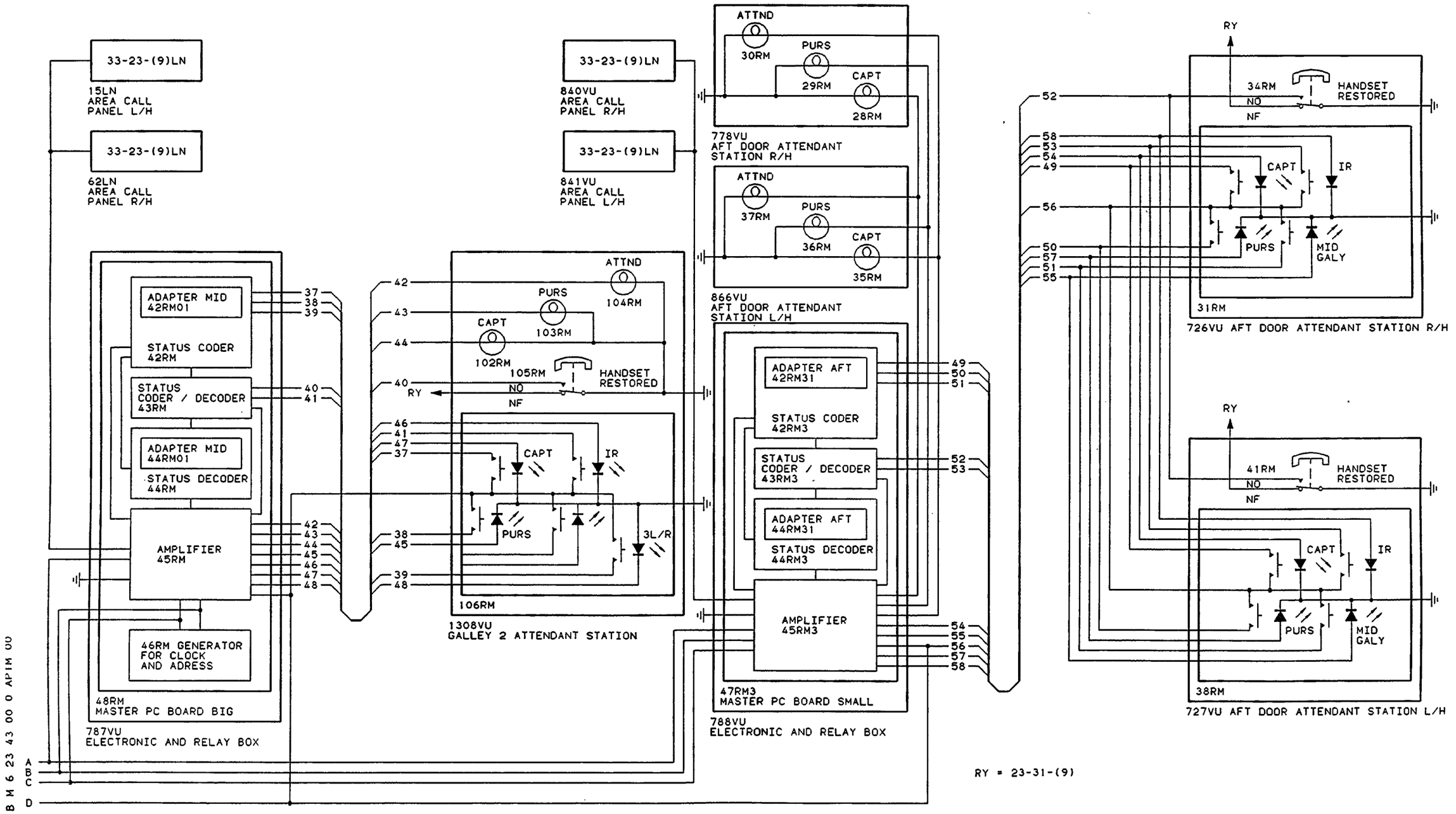
(Ref. Fig. 011)

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B M 6 23 43 00 0 APTA 00

Cabin and Flight Crew Call System-Schematic
(Sheet 1/2)
Figure 011

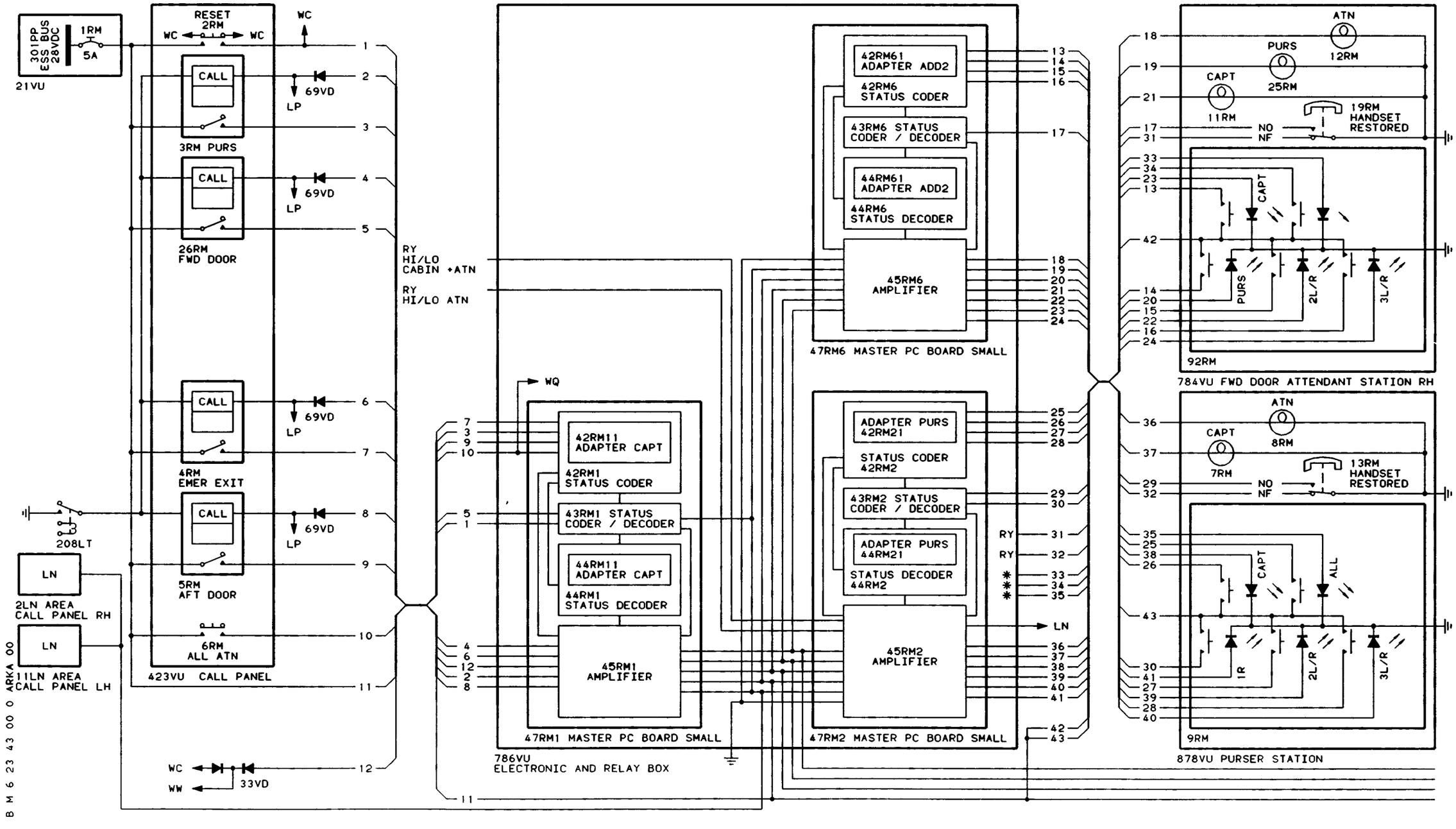



Cabin and Flight Crew Call System-Schematic
(Sheet 2/2)
Figure 011

**ON A/C 101-200,

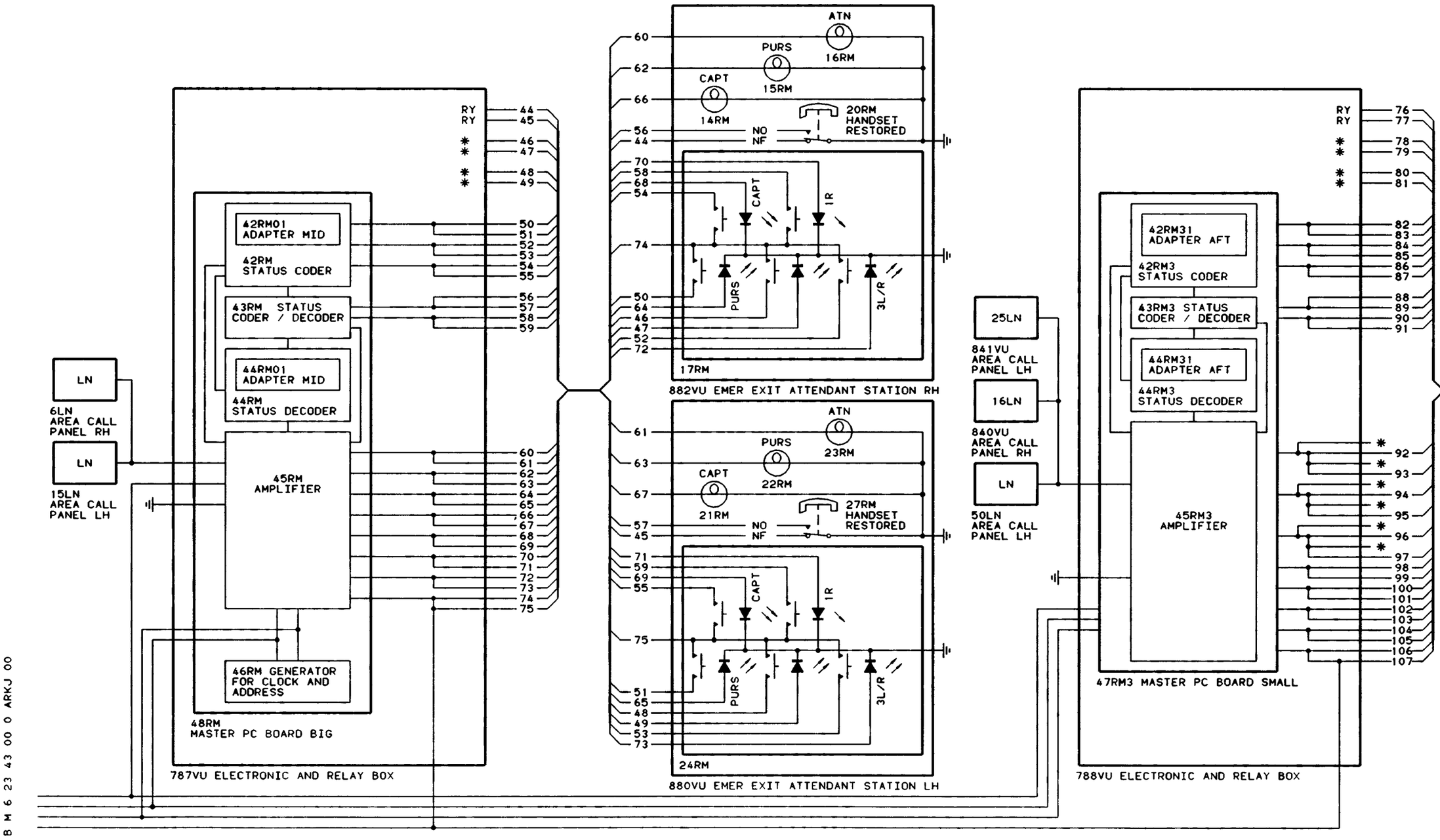
(Ref. Fig. 012)

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Cabin and Flight Crew Call System-Schematic
(Sheet 1/3)
Figure 012

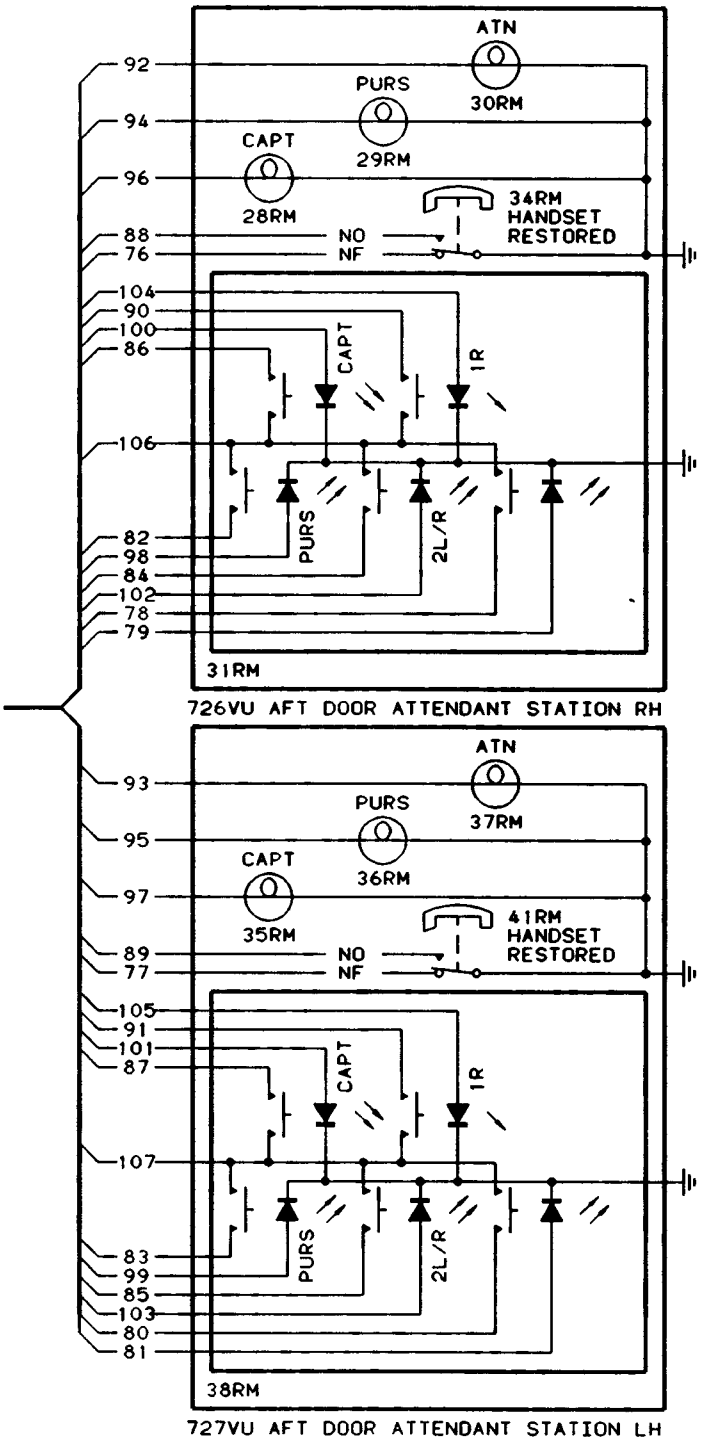
R




B M 6 23 43 00 0 ARKJ 00

Cabin and Flight Crew Call System-Schematic
(Sheet 2/3)
Figure 012

R




NOTE:

RY = 23-32-(9) PASSENGER ADDRESS SYSTEM

WQ = 26-17-00 SMOKE DETECTION-LAVATORY

LN = 33-23-(9) CALL SYSTEM

B M 6 23 43 00 0 ARKS 00

Cabin and Flight Crew Call System-Schematic
(Sheet 3/3)
Figure 012

R

1. Operational Test

A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |

Referenced Procedures

| | |
|---|---|
| - 23-31-00, P. Block 501 | Passenger Address System |
| - 24-41-00, P. Block 301 | AC External Power Control |

B. Job Set-Up

(1)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Make certain that electronics racks ventilation is correct.
(3)Make certain that the passenger address system is working (Ref. 23-31-00, P. Block 501).
(4)Make certain that the following circuit breaker is closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | CALLS CABIN | 1RM | J 7 |

C. Test

NOTE : The test described below is for the LH attendant stations. The RH attendant stations are identical and are tested by referring to the information in brackets.

(1)Captain to Purser or Attendant Call

| ACTION | RESULT |
|---|---|
| **ON A/C 001-100, | |
| 1. At Captain's call panel 423VU:<br>- press pushbutton switch PURS CALL. | At Cabin and Attendant loudspeakers:<br>- a HI/LO tone chime is broadcast:<br>At Purser's handset panel:<br>- call light CAPT comes on.<br>At all Attendants' handset panels:<br>- busy indicator light PURS comes on.<br>Cabin Compartment:<br>- red lamp in the area call light panel comes on. |
| 2. At Purser's handset panel:<br>- lift handset. | At Purser's handset panel:<br>- call light CAPT goes off.<br>At all area call light panels:<br>- red lamp goes off. |
| - replace handset. | At each Attendant's handset panel: |

| ACTION | RESULT |
|---|---|
| | - busy indicator light PURS goes off. |
| 3. At Captain's call panel 423VU:<br>- press pushbutton FWD DOOR CALL. | At Attendant loudspeakers:<br>- a HI/LO tone chime is broadcast.<br>At Fwd Door Attendant's handset panel RH:<br>- call light CAPT comes on.<br>At Purser's and other Attendants' handset panels:<br>- busy indicator light 1 R comes on. |
| 4. At Fwd Door Attendant's handset Panel (RH):<br>- lift handset.<br>- replace handset. | At Fwd Door Attendant's handset panel:<br>- call light CAPT goes off.<br>At Purser's and other Attendants' handset panels:<br>- busy indicator light 1R goes off. |
| 5. At Captain's call panel 423VU:<br>- press pushbutton MID GALY CALL. | At Attendant loudspeakers:<br>- a HI/LO tone chime is broadcast.<br>At MID GALLEY Attendants' handset panel:<br>- call light CAPT comes on.<br>At Purser's and other Attendants' handset panels:<br>- busy indicator light MID GALY comes on. |
| 6. At MID GALLEY Attendant's handset panel:<br>- lift handset.<br>- replace handset. | At MID GALLEY Attendant's handset panel:<br>- call light CAPT goes off.<br>At Purser's and other Attendants' handset panels:<br>- busy indicator light MID GALY goes off. |
| 7. At Captain's call panel 423VU:<br>- press pushbutton AFT DOOR CALL. | At Attendant loudspeakers:<br>- a HI/LO tone chime is broadcast.<br>At Aft Door Attendant's handset panels:<br>- call light CAPT comes on.<br>At Purser's and other Attendants' handset panels:<br>- busy indicator light 3 L/R comes on. |
| 8. At Aft Door Attendant's handset panel LH (RH)<br>- lift handset.<br>- replace handset. | At Aft Door Attendant's handset panels:<br>- call light CAPT goes off.<br>At Purser's and other Attendants' handset panels:<br>- busy indicator light 3 L/R goes off. |
| 9. At Captain's call panel 423VU:<br>- press pushbutton ALL ATTND. | At Cabin and Attendant loudspeakers:<br>- a HI/LO tone chime is broadcast. |

| ACTION | RESULT |
|---|---|
| | At all handset panels:<br>- call light **CAPT** comes on.<br>- all appropriate busy indicator lights, except **CAPT**, come on.<br>At all area call light panels:<br>- a red lamp in each panel flashes at approximately 15 times per minute. |
| 10. At Captain's call panel 423VU:<br>- press pushbutton **RESET**. | - all call indications in 9. are cancelled. |
| 11. At any Attendant's handset panel:<br>- lift handset. | Cabin compartment:<br>- all area call lights go off.<br>At selected stations:<br>- call lights **CAPT** go off. |
| - replace handset. | Cabin compartment:<br>- all indications go off. |

R **ON A/C 101-200,

| | | |
|---|---|---|
| R | 1. At Captain's call panel 423VU:<br>- press pushbutton switch **PURS CALL** one or more times. | At Cabin and Attendant loudspeakers:<br>- a **HI/LO** tone chime is broadcast as often as pushbutton is pressed.<br>At Purser's handset panel:<br>- call light **CAPT** comes on.<br>At all Attendant's handset panels:<br>- busy indicator light **PURS** comes on. |
| R | 2. At Purser's handset panel:<br>- lift handset.<br>- replace handset. | At Purser's handset panel:<br>- call light **CAPT** goes off.<br>At each Attendant's handset panel:<br>- busy indicator light **PURS** goes off. |
| R | 3. At Captain's call panel 423VU:<br>- press pushbutton **FWD DOOR CALL** one or more times. | At Attendant loudspeakers:<br>- a **HI/LO** tone chime is broadcast as often as pushbutton is pressed.<br>At Fwd Door Attendant's handset panel **RH**:<br>- call light **CAPT** comes on.<br>At Purser's and other Attendants' handset panels:<br>- busy indicator light **1 R** comes on. |
| R | 4. At Fwd Door Attendant's handset panel (**RH**):<br>- lift handset.<br>- replace handset. | At Fwd Door Attendant's handset panel:<br>- call light **CAPT** goes off.<br>At Purser's and other Attendants' handset panels:<br>- busy indicator light **1 R** goes off. |
| R | 5. At Captain's call panel 423VU:<br>- press pushbutton **EMER EXIT CALL** one or more times. | At Attendant loudspeakers:<br>- a **HI/LO** tone chime is broadcast as often as pushbutton is pressed.<br>At Emer Exit Attendant's handset |

| | ACTION | RESULT |
|---|---|---|
| R | | panel: |
| R | | - call light **CAPT** comes on. |
| R | | At Purser's and other Attendants' |
| R | | handset panels: |
| R | | - busy indicator light 2 L/R |
| R | | comes on. |
| R | 6. At Emer Exit Attendant handset | At Emer Exit Attendant handset |
| R | panels: | panels: |
| R | - lift handset. | - call light **CAPT** goes off. |
| R | - replace handset. | At Purser's and other Attendants' |
| R | | handset panels: |
| R | | - busy indicator light 2 L/R |
| R | | goes off. |
| R | 7. At Captain's call panel 423VU: | At Attendant loudspeakers: |
| R | - press pushbutton **AFT DOOR CALL** | - a **HI/LO** tone chime is broadcast |
| R | one or more times. | as often as pushbutton is pressed. |
| R | | At Aft Door Attendant's handset |
| R | | panels: |
| R | | - call light **CAPT** comes on. |
| R | | At Purser's and other Attendants' |
| R | | handset panels: |
| R | | - busy indicator light 3 L/R |
| R | | comes on. |
| R | 8. At Aft Door Attendant's handset panel | At Aft Door Attendant's handset |
| R | **LH (RH)** | panels: |
| R | - lift handset. | - call light **CAPT** goes off. |
| R | - replace handset. | At Purser's and other Attendants' |
| R | | handset panels: |
| R | | - busy indicator light 3 L/R |
| R | | goes off. |
| R | 9. At Captain's call panel 423VU: | At Cabin and Attendant loudspeakers: |
| R | - press pushbutton **ALL ATTND** | - a **HI/LO** tone chime is broadcast |
| R | one or more times. | as often as pushbutton is pressed. |
| R | | At all handset panels: |
| R | | - call light **CAPT** comes on. |
| R | | - all appropriate busy indicator |
| R | | lights, except **CAPT**, come on. |
| R | | At all area call light panels: |
| R | | - a red lamp comes on. |
| R | 10. At Captain's call panel 423VU: | |
| R | - press pushbutton **RESET**. | - all call indications in 9. are |
| R | | cancelled. |
| R | 11. Repeat 9. | - indications as in 9. |
| R | 12. At any attendants' handset panel: | Cabin compartment: |
| R | - lift handset. | - all area call lights go off. |
| R | | At selected stations: |
| R | | - call lights **CAPT** go off. |
| R | - replace handset. | Cabin compartment: |
| R | | - all indications go off. |

R **ON A/C 001-100,

(2)Purser to Captain or Attendants Call

| ACTION | RESULT |
|---|---|
| 1. At Purser's handset panel:<br>- lift handset and press push-button **CAPT**. | At Captain's call panel:<br>- indicator light **PURS CALL** comes on.<br>In Flight Compartment:<br>- buzzer tone broadcast over loudspeakers.<br>At all Attendants' handset panels:<br>- busy indicator light **CAPT** comes on. |
| 2. At Purser's handset panel:<br>- replace handset. | - the indications in 1. go off. |
| 3. At Purser's handset panel:<br>- lift handset and press push-button **1R**. | At Cabin and Attendant loudspeakers:<br>- a **HI/LO** tone chime is broadcast.<br>At Fwd Door Attendant's handset panel **RH**:<br>- call light **PURS** comes on.<br>At all other Attendants' handset panels:<br>- busy indicator light **1R** comes on. |
| 4. At Purser's handset panel:<br>- replace handset. | - the indications in 3. go off. |
| 5. At Purser's handset panel:<br>- lift handset and press push-button **MID GALY**. | At Cabin and Attendant loudspeakers:<br>- a **HI/LO** tone chime is broadcast.<br>At **MID GALLEY** Attendant's handset panel:<br>- call light **PURS** comes on.<br>At all other Attendants' handset panels:<br>- busy indicator light **MID GALY** comes on. |
| 6. At Purser's handset panel:<br>- replace handset. | - the indications in 5. go off. |
| 7. At Purser's handset panel:<br>- lift handset and press push-button **3 L/R**. | At Cabin and Attendant loudspeakers:<br>- a **HI/LO** tone chime is broadcast.<br>At Aft Attendant's handset panels:<br>- call light **PURS** comes on.<br>At all other Attendants' handset panels:<br>- busy indicator light **3 L/R** comes on. |
| 8. At Purser's handset panel:<br>- replace handset. | - the indications in 7. go off. |
| 9. At Purser's handset panel:<br>- lift handset and press push-button **ALL ATTN**. | At Cabin and Attendant loudspeakers:<br>- a **HI/LO** tone chime is broadcast.<br>At all Attendants' handset panels:<br>- call light **PURS** comes on.<br>- busy indicator lights **1R, MID GALY** |

| ACTION | RESULT |
|---|---|
| | and 3 L/R come on. |
| 10. At Purser's handset panel:<br>- replace handset. | - the indications in 9. go off. |

R **ON A/C 101-200,

R (2)Purser to Captain or Attendants Call

| R | ACTION | RESULT |
|---|---|---|
| R | 1. At Purser's handset panel:<br>- lift handset and press push-button CAPT one or more times. | At Captain's call panel:<br>- indicator light PURS CALL comes on.<br>In flight compartment:<br>- buzzer tone broadcast over loud-speakers as often as pushbutton is pressed.<br>At all Attendants' handset panels:<br>- busy indicator light CAPT comes on. |
| R | - replace handset. | in flight compartment:<br>- indications in step 1. go off. |
| R | 2. At Purser's handset panel:<br>- lift handset and repress push-button 1 R one or more times. | At FWD DOOR Attendant's handset panel:<br>- call light PURS comes on.<br>At all Attendants' handset panels:<br>- busy indicator light 1 R comes on.<br>At cabin and Attendant loudspeakers:<br>- a HI/LO tone chime is broadcast as often as pushbutton is pressed. |
| R | - replace handset | At all Attendants' handset panels:<br>the indications in step 2. go off. |
| R | 3. At Purser's handset panel:<br>- lift handset and repress push-button 2 L/ R one or more times. | At EMER EXIT DOOR Attendant's handset panels:<br>- call light PURS comes on.<br>At all Attendants' handset panels:<br>- busy indicator light 2L/R comes on.<br>At cabin and Attendant loudspeakers:<br>- a HI/LO tone chime is broadcast as often as pushbutton is pressed. |
| R | - replace handset | At all Attendants' handset panels:<br>the indications in step 3. go off. |
| R | 4. At Purser's handset panel:<br>- lift handset and repress push-button 3 L/ R one or more times. | At AFT DOOR Attendant's handset panels:<br>- call light PURS comes on.<br>At all Attendants' handset panels:<br>- busy indicator light 3L/R comes on.<br>At cabin and Attendant loudspeakers:<br>- a HI/LO tone chime is broadcast as often as pushbutton is pressed. |
| R | - replace handset | At all Attendants' handset panels: |

| ACTION | RESULT |
|---|---|
| | the indications in step 4. go off. |
| 5. At Purser's handset panel:<br>- press pushbutton **ALL ATTND** | At all Attendants' handset panels:<br>- call light **PURS** comes on.<br>- busy indicator lights 1 R, 2 L/R and 3 L/R come on.<br>At all cabin and Attendant's loudspeakers:<br>- a HI/LO tone chime is broadcast as often as pushbutton is pressed. |
| - replace handset. | At all Attendants' handset panels:<br>- indications in step 6. go off. |

**ON A/C 001-100,

(3)Attendant to Captain, Purser or Attendant Call

| ACTION | RESULT |
|---|---|
| 1. At Fwd Door Attendant's handset panel RH:<br>- lift handset and press push-button **CAPT.** | At Captain's call panel 423VU:<br>- indicator light **FWD DOOR CALL** comes on.<br>In Flight Compartment:<br>- buzzer tone broadcast over loudspeakers.<br>At Purser's and all other Attendant's handset panels:<br>- busy indicator light **CAPT** comes on. |
| 2. At Fwd Door Attendant's handset panel RH:<br>- replace handset. | - indications in 1. go off. |
| 3. At Fwd Door Attendant's handset panel RH:<br>- lift handset and press pushbutton **PURS.** | At Attendant loudspeakers:<br>- a HI/LO tone chime is broadcast.<br>At Purser's handset panel:<br>- call light **ATTN** comes on.<br>At all other Attendants' handset panels:<br>- busy indicator light **PURS** comes on. |
| 4. At Fwd Door Attendant's handset panel RH:<br>- replace handset. | - indications in 3. go off. |
| 5. At Fwd **DOOR** Attendant's handset panel RH.<br>- lift handset and press pushbutton **MID GALY.** | At Attendant loudspeakers:<br>- A HI/LO tone chime broadcast.<br>At MID GALLEY Attendant's handset panel:<br>- call light **ATTN** comes on.<br>- At Purser's and all other Attendants' handset panels: |

| ACTION | RESULT |
|---|---|
| | - busy indicator light **MID GALY** comes on. |
| **6.** At Fwd **DOOR** Attendant's handset panel **RH:**<br>- replace handset. | - indications in **5.** go off. |
| **7.** At Fwd Door Attendant's handset panel **RH:**<br>- lift handset and press push-button **3 L/R.** | At Attendant loudspeakers:<br>- a **HI/LO** tone chime is broadcast.<br>At Aft Attendant's handset panels:<br>- call light **ATTN** comes on.<br>At Purser's and all other Attendants' handset panels:<br>- busy indicator light **3 L/R** comes on. |
| **8.** At Fwd Door Attendant's handset panel **RH:**<br>- replace handset. | - indications in **7.** go off. |
| **9.** At **MID GALLEY** Attendant's handset panel:<br>- lift handset and press push-button **CAPT.** | At Captain's call panel **423VU:**<br>- indicator light **MID GALY CALL** comes on.<br>In Flight Compartment:<br>- buzzer tone broadcast over loud-speakers.<br>At Purser's and all other Attendants' handset panels:<br>- busy indicator light **CAPT** comes on. |
| **10.** At **MID GALLEY** Attendant's handset panel:<br>- replace handset. | - indications in **9** go off. |
| **11.** At **MID** Galley Attendant's handset panel:<br>- lift handset and press pushbutton **PURS.** | At Attendant loudspeakers:<br>- a **HI/LO** tone chime is broadcast.<br>At Purser's handset panel:<br>- call light **ATTN** comes on.<br>At all other Attendants' handset panels:<br>- busy indicator light **PURS** comes on. |
| **12.** At **MID GALLEY** Attendant's handset panel:<br>- replace handset. | - indications in **11.** go off. |
| **13.** At **MID GALLEY** Attendant's handset panel:<br>- lift handset and press pushbutton **1R.** | At Attendant loudspeakers:<br>- a **HI/LO** tone chime broadcast.<br>At Fwd Attendant's handset panel:<br>- call light **ATTN** comes on.<br>At Purser's and all other Attendants' handset panels:<br>- busy indicator light **1R** comes on. |
| **14.** At **MID GALLEY** Attendant's handset | At Attendant loudspeakers: |

| ACTION | RESULT |
|---|---|
| panel:<br>- lift handset and press push-button 3 L/R. | - a HI/LO tone chime is broadcast.<br>At Aft Attendant's handset panels:<br>- call light ATTN comes on.<br>At Purser's and all other Attendants' handset panels:<br>- busy indicator light 3 L/R comes on. |
| 15. At MID GALLEY Attendant's handset panel:<br>- replace handset. | - indications in 14. go off. |
| 16. At Aft Door Attendant's handset panel LH (RH):<br>- lift handset and press push-button CAPT. | At Captain's call panel 423VU:<br>- indicator light AFT CALL comes on.<br>In Flight Compartment:<br>- buzzer tone broadcast over loud-speakers.<br>At Purser's and other Attendants' handset panels:<br>- busy indicator light CAPT comes on. |
| 17. At Aft Door Attendant's handset panel LH (RH):<br>- replace handset. | - indications in 16. go off. |
| 18. At Aft Door Attendant's handset panel LH (RH):<br>- lift handset and press pushbutton PURS. | At Attendant loudspeakers:<br>- a HI/LO tone chime is broadcast.<br>At Purser's handset panel:<br>- call light ATTN comes on.<br>At all other Attendants' handset panels:<br>- busy indicator light PURS comes on. |
| 19. At Aft Door Attendant's handset panel LH (RH):<br>- replace handset. | - indications in 18. go off. |
| 20. At Aft Door Attendant's handset panel LH (RH).<br>- lift handset and press pushbutton 1R. | At Attendant loudspeakers:<br>- a HI/LO tone chime broadcast.<br>At Fwd Attendant's handset panel RH:<br>- call light ATTN comes on.<br>At Purser's and other Attendants' handset panels:<br>- busy indicator light 1 R comes on. |
| 21. At Aft Door Attendant's handset panel LH (RH).<br>- replace handset. | - indications in 20. go off. |
| 22. At Aft Door Attendant's handset panel LH (RH):<br>- lift handset and press push-button MID GALY. | At Attendant loudspeakers:<br>- a HI/LO tone chime is broadcast.<br>At MID GALLEY Attendant's handset panel: |

| ACTION | RESULT |
|---|---|
| | - call light **ATTN** comes on.<br>At Purser's and other Attendants' handset panels:<br>- busy indicator light **MID GALY** comes on. |
| 23. At Aft Door Attendant's handset panel LH (RH):<br>- replace handset. | - indications in 22. go off. |

R **ON A/C 101-200,

R (3)Attendant to Captain, Purser or Attendant Call.

| R | ACTION | RESULT |
|---|---|---|
| R | 1. At **RH FWD DOOR** Attendant's handset panel:<br>- lift handset and repress push-button **CAPT** one or more times. | At Captain's call panel **423VU**:<br>- indicator light **FWD DOOR CALL** comes on.<br>In flight compartment:<br>- buzzer tone broadcast over loud-speaker as often as pushbutton is pressed.<br>At Purser's and other Attendants' handset panels:<br>- busy indicator light **CAPT** comes on. |
| R | - replace handset. | - indications in step 1. go off. |
| R | 2. At **RH FWD DOOR** Attendant's handset panel:<br>- lift handset and repress pushbut-ton **PURS** one or more times. | At Purser's handset panel:<br>- call light **ATTN** comes on.<br>At all other Attendants' handset panels:<br>- busy indicator light **PURS** comes on.<br>At all attendant's loudspeakers:<br>- a **HI/LO** tone chime is broadcast as often as pushbutton is pressed. |
| R | - replace handset. | - all indications in step 2. go off. |
| R | 3. At **RH FWD DOOR** Attendant's handset panel:<br>- lift handset and repress pushbut-ton 2 L/R one or more times. | At **EMER EXIT DOOR** Attendant's handset panels:<br>- call light **ATTN** comes on.<br>At all other Attendants' handset panels:<br>- busy indicator light 2L/R comes on.<br>At all attendant's loudspeakers:<br>- a **HI/LO** tone chime is broadcast as often as pushbutton is pressed. |
| R | - replace handset. | - all indications in step 3. go off. |
| R | 4. At **RH FWD DOOR** Attendant's handset | At **AFT DOOR** Attendant's handset |

| ACTION | RESULT |
|---|---|
| panel: | panels: |
| - lift handset and repress pushbutton 3 L/R one or more times. | - call light ATTN comes on. |
| | At all other Attendants' handset panels: |
| | - busy indicator light 3L/R comes on. |
| | At all attendant's loudspeakers: |
| | - a HI/LO tone chime is broadcast as often as pushbutton is pressed. |
| - replace handset. | - all indications in step 4. go off. |
| 5. At EMER EXIT DOOR Attendant's handset panels: | At Captain's call panel 423VU: |
| - lift handset and repress pushbutton CAPT one or more times. | - indicator light EMER EXIT DOOR CALL comes on. |
| | In flight compartment: |
| | - buzzer tone broadcast over loudspeaker as often as pushbutton is pressed. |
| | At PURSER's and other Attendants' handset panels: |
| | - busy indicator light CAPT comes on. |
| - replace handset. | - indications in step 5. go off. |
| 6. At EMER EXIT DOOR Attendant's handset panels: | At Purser's handset panel: |
| - lift handset and repress pushbutton PURS one or more times. | - call light ATTN comes on. |
| | At all other Attendants' handset panels: |
| | - busy indicator light PURS comes on. |
| | At all attendant's loudspeakers: |
| | - a HI/LO tone chime is broadcast as often as pushbutton is pressed. |
| - replace handset. | - all indications in step 6. go off. |
| 7. At EMER EXIT DOOR Attendant's handset panels: | At RH FWD DOOR Attendant's handset panel: |
| | - call light ATTN comes on. |
| - lift handset and repress pushbutton 1 R one or more times. | |
| | At all other Attendants' handset panels: |
| | - busy indicator light 1 R comes on. |
| | At all attendant's loudspeakers: |
| | - a HI/LO tone chime is broadcast as often as pushbutton is pressed. |
| - replace handset. | - all indications in step 7. go off. |
| 8. At EMER EXIT DOOR Attendant's handset panels: | At AFT DOOR Attendant's handset panel: |
| | - call light ATTN comes on. |
| - lift handset and repress pushbutton 3 L/R one or more times. | |

| | ACTION | RESULT |
|---|---|---|
| | | At all other Attendants' handset panels: |
| | | - busy indicator light 3L/R comes on. |
| | | At all attendant's loudspeakers: |
| | | - a HI/LO tone chime is broadcast as often as pushbutton is pressed. |
| | - replace handset. | - all indications in step 8. go off. |
| | 9. At LH AFT DOOR Attendant's handset panel: | At Captain's call panel 423VU: |
| | - lift handset and repress push-button CAPT one or more times | - indicator light AFT DOOR CALL comes on. |
| | | In flight compartment: |
| | | - buzzer tone broadcast over loud-speaker as often as pushbutton is pressed. |
| | | At PURSERΔs and other Attendants' handset panels: |
| | | - busy indicator light CAPT comes on. |
| | - replace handset. | - indications in step 9. go off. |
| | 10. At LH AFT DOOR Attendant's handset panel: | At Purser's handset panel: |
| | - lift handset and repress pushbut-ton PURS one or more times. | - call light ATTN comes on. |
| | | At all other Attendants' handset panels: |
| | | - busy indicator light PURS comes on. |
| | | At all attendant's loudspeakers: |
| | | - a HI/LO tone chime is broadcast as often as pushbutton is pressed. |
| | - replace handset. | - all indications in step 10. go off. |
| | 11. At LH AFT DOOR Attendant's handset panel: | At RH FWD DOOR Attendant's handset panel: |
| | - lift handset and repress pushbut-ton 1 R one or more times. | - call light ATTN comes on. |
| | | At all other Attendants' handset panels: |
| | | - busy indicator light 1 R comes on. |
| | | At all attendant's loudspeakers: |
| | | - a HI/LO tone chime is broadcast as often as pushbutton is pressed. |
| | - replace handset. | - all indications in step 11. go off. |
| | 12. At AFT DOOR Attendant's handset panel | At EMER EXIT DOOR Attendant's handset panels: |
| | - lift handset and repress pushbut-ton 2 L/R one or more times. | - call light ATTN comes on. |
| | | At all other Attendants' handset panels: |
| | | - busy indicator light 2L/R comes on. |

| ACTION | RESULT |
|---|---|
| | At all attendant's loudspeakers:<br>- a HI/LO tone chime is broadcast as often as pushbutton is pressed.<br>- all indications in step 12. go off. |
| - replace handset. | |
| 13. Repeat steps 9. thru 12. for RH AFT DOOR Attendant's handset panel. | - indications as for steps 9. thru 12. |

**ON A/C ALL

C. Close-Up
(1)De-energize aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(2)Make certain that the working area is clean and clear of tools and miscellaneous items of equipment.

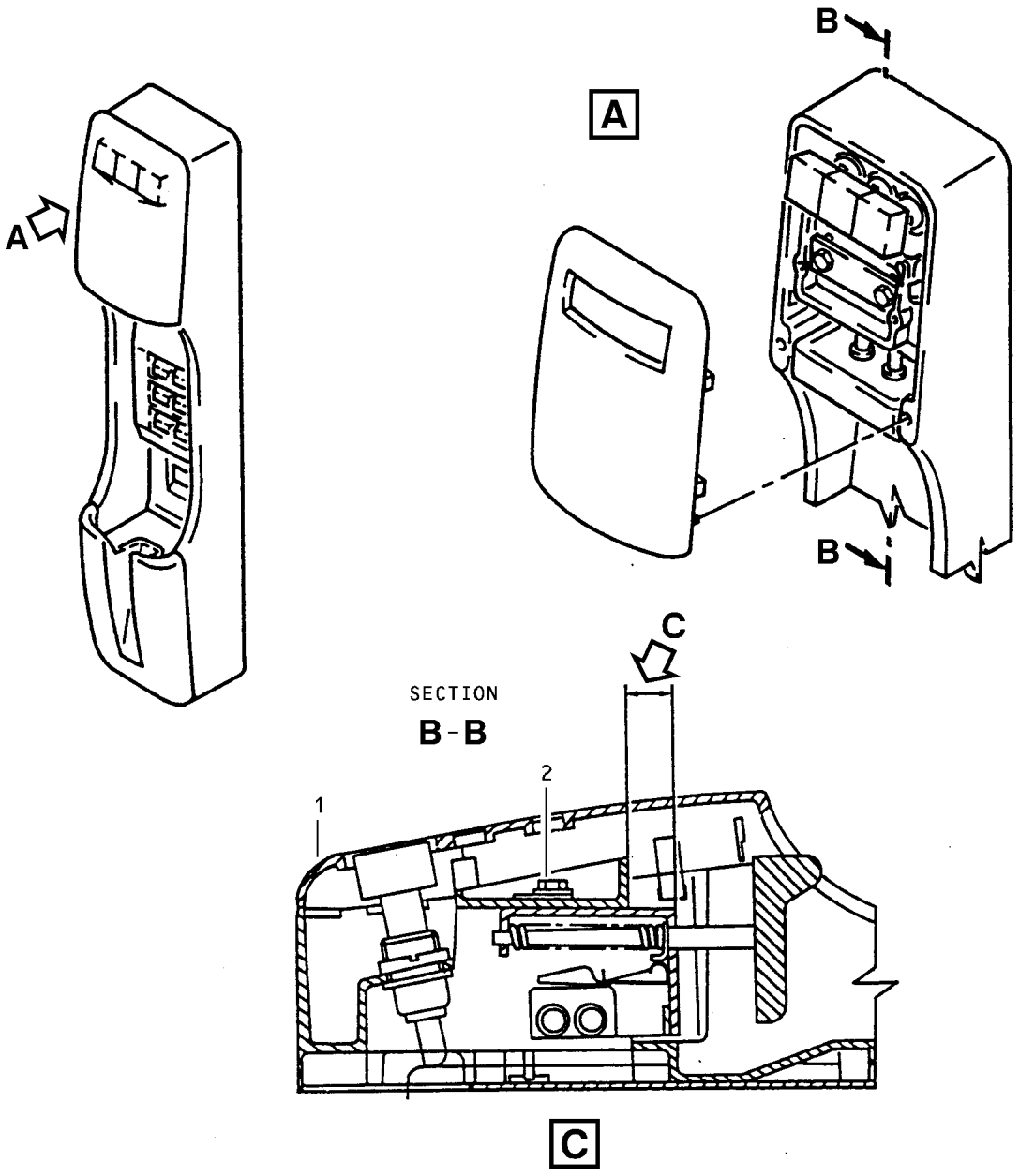
2. Adjustment of Handset-holder

A. Job Set-Up
(1)Open, safety and tag the following circuit breaker:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | CALLS CABIN | 1RM | J7 |

B. Adjustment of microswitch in handset retaining part:
(Ref. Fig. 501)
- remove handset.
- compress and remove cover plate (1).
- loosen screws (2).
- perform adjustment according to table C.
- tighten screws (2).
- replace cover plate and handset.

D. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.




| MANUFACTURER | PN | ADJUSTMENT |
|---|---|---|
| HOLMBERG | 89-01-XXXXX-16 | 13+/-0.5mm (0.51+/-0.02 inch.) |
| HOLMBERG | 750T2112-XX | 3+/-0.5mm (0.12+/-0.02 inch.) |
| TELEPHONICS | 448-1000-001 | 12+/-0.5mm (0.47+/-0.02 inch.) |

BM6 23 43 00 5 AAMD 01

Handset Retaining Part.
Figure 501

1. Reason for the Job

A. Replacement of Junction Box.

B. Replacement of Printed Circuit Boards.

2. Replacement of Junction Box

A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| (2) | Stepladder 2.0 m (7 ft.) |

Referenced Procedures

| | |
|---|---|
| - 23-31-00, P. Block 501 | Passenger Address System |
| - 23-43-00, P. Block 501 | Cabin and Flight Crew Call System |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 25-23-11, P. Block 401 | Ceiling Panels |
| - 25-23-13, P. Block 401 | Utility Area Ceiling Panels |

R **ON A/C 001-100,

B. Procedure

(1)Job Set-Up

(a)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | CALLS CABIN | 1RM | J 7 |
| 22VU | COM PASSENGER ADDRESS | 5RY | B15 |
| 800VU | CALL SYSTEM PASS | 1LN | E13 |
| 811VU | CALL SYSTEM PASSENGER | 27LN | B14 |

R **ON A/C 101-200,

R B. Procedure
R (1)Job Set-Up
R (a)Open, safety and tag the following circuit breakers:

| R PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| R 21VU | CALLS CABIN | 1RM | J 7 |
| R 22VU | COM PASSENGER ADDRESS | 5RY | B15 |
| R 800VU | CALL SYSTEM LAV | 4LN | E12 |

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 811VU | CALL SYSTEM LAVATORY | 29LN | B16 |

**ON A/C ALL

(Ref. Fig. 401)
(b)Position stepladder.
(c)Open relevant ceiling panels (Ref. 25-23-11, P. Block 401 and 25-23-13, P. Block 401) to gain access to junction box.
(2)Removal
(a)Disconnect electrical connectors (2).
(b)Remove screws (3) and washers (4), securing junction box (1).
(3)Installation
(a)Install junction box (1), with screws (3) and washers (4).
(b)Connect electrical connectors (2).
(c)Replace panels (Ref. 25-23-11, P. Block 401 and 25-23-13, P. Block 401).
(d)Remove safety clips and tags and close circuit breakers opened in step B.(1)(a).

C. Test
(1)Connect aircraft electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Carry out test procedures (Ref. 23-43-00, P. Block 501 and 23-31-00, P. Block 501).

D. Close-Up
(1)Close relevant ceiling panel (Ref. 25-23-11, P. Block 401).
(2)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(3)De-energize aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

3. Replacement of Printed Circuit Board

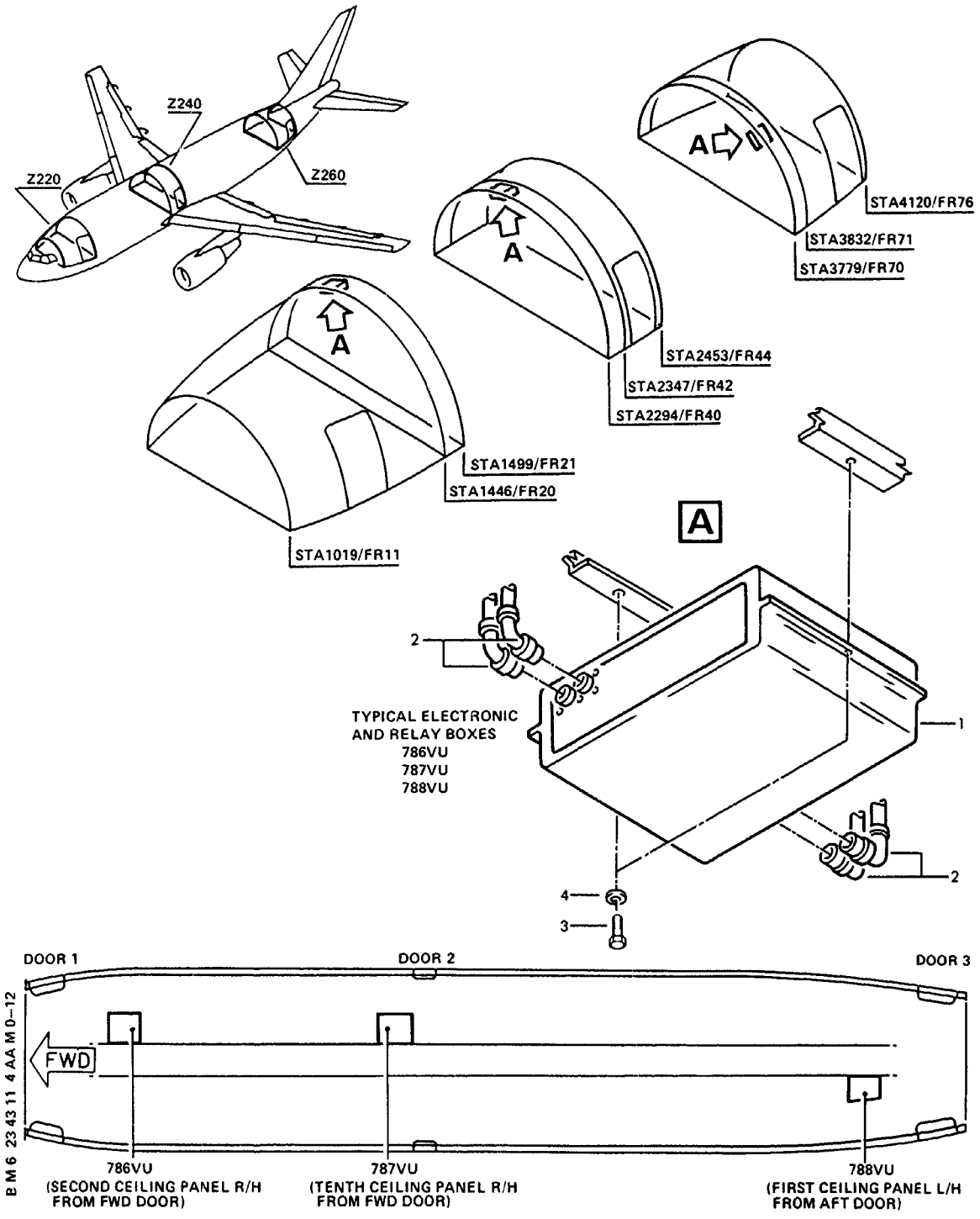
A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| (2) | Stepladder 2.0 m (7 ft.) |
| (3) | Antistatic Safety Equipment |

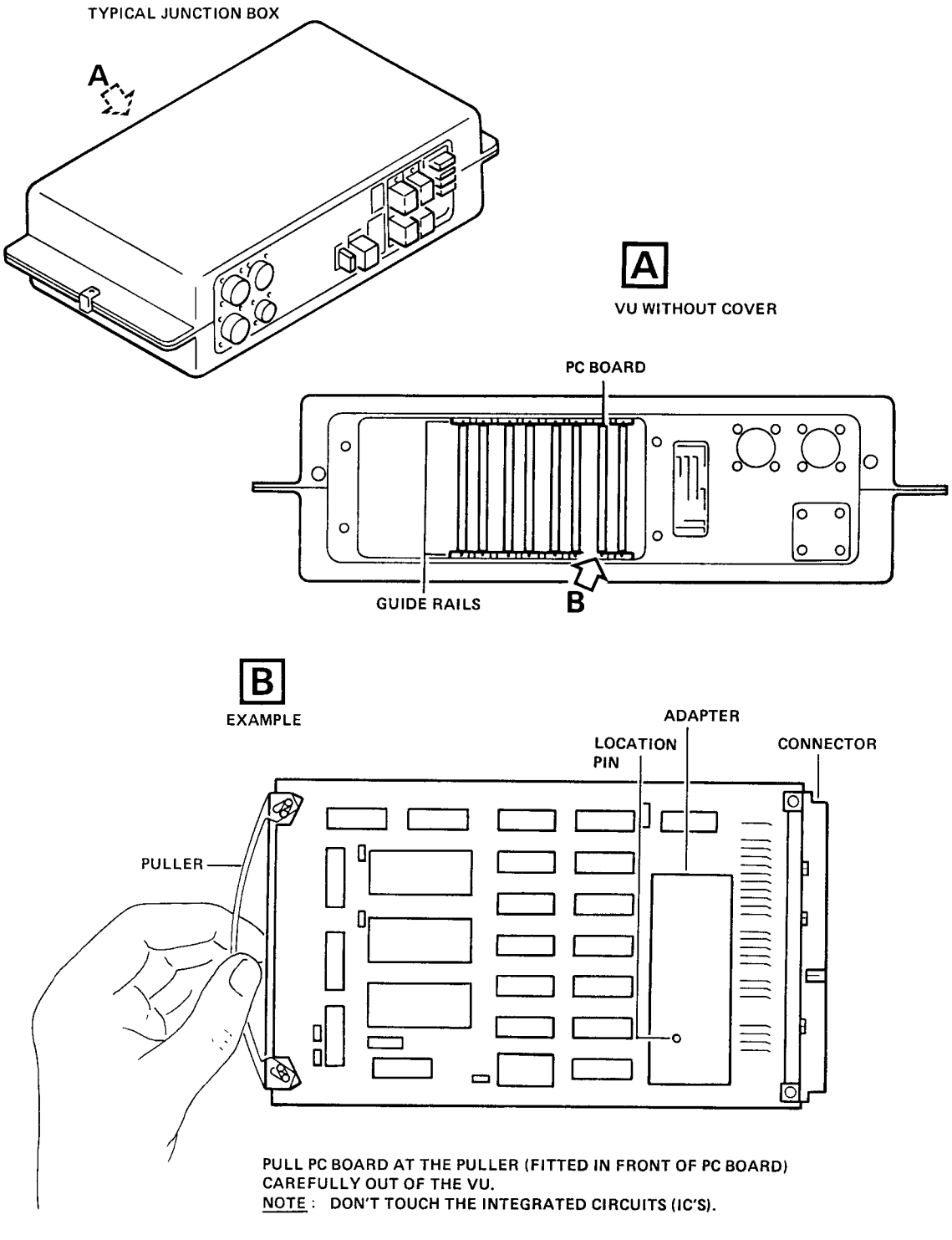
Referenced Procedures

| | |
|---|---|
| - 23-31-00, P. Block 501 | Passenger Address System |
| - 23-43-00, P. Block 501 | Cabin and Flight Crew Call System |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 25-23-11, P. Block 401 | Ceiling Panels |

(Ref. Fig. 402)

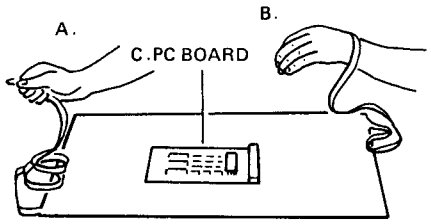



Junction Box
Figure 401

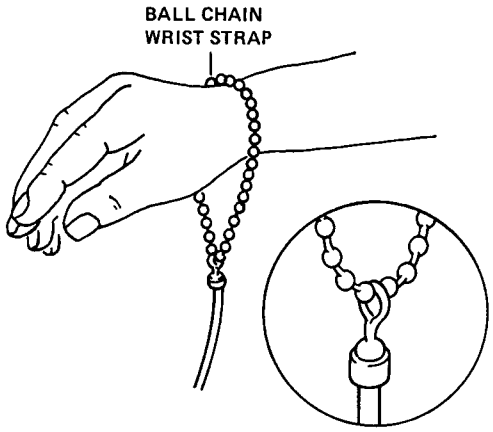



BM6 23 43 11 4 ACAA 00

PC Board Adapter (Sheet 1/3)
Figure 402




TYPICAL CONDUCTIVE WORK MAT

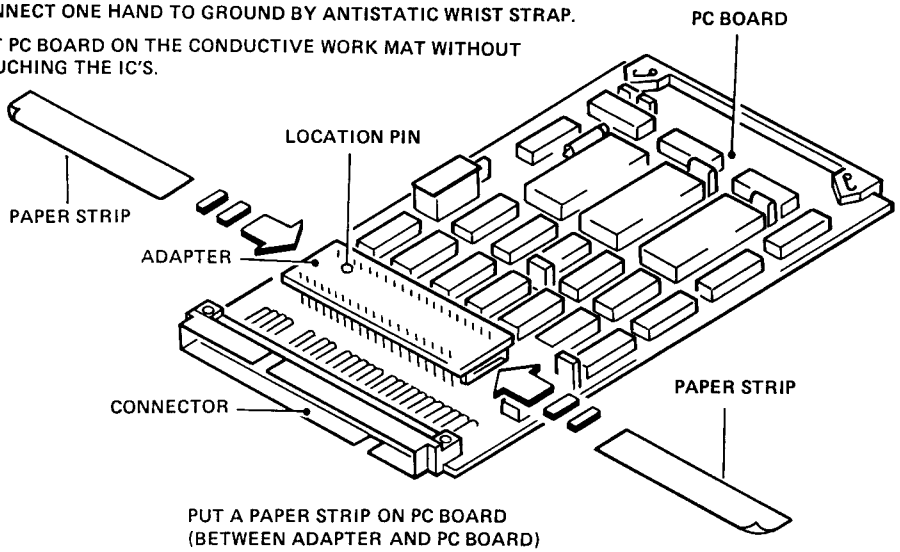



PLACE CONDUCTIVE MAT IN WORK AREA ADJACENT TO THE FAULTY JUNCTION BOX.

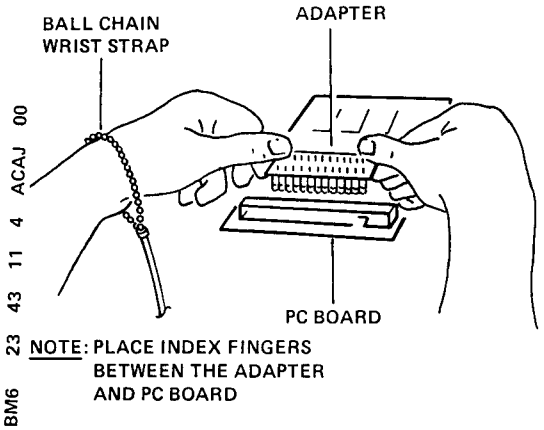
A. CONNECT THE MAT TO GROUND.

B. CONNECT ONE HAND TO GROUND BY ANTISTATIC WRIST STRAP.

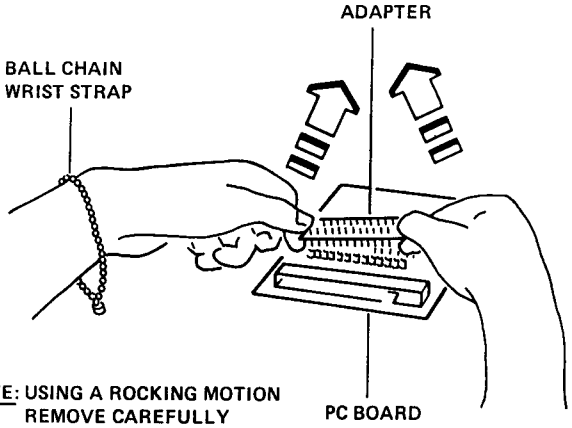
C. PUT PC BOARD ON THE CONDUCTIVE WORK MAT WITHOUT TOUCHING THE IC'S.




PUT A PAPER STRIP ON PC BOARD
(BETWEEN ADAPTER AND PC BOARD)




NOTE: PLACE INDEX FINGERS BETWEEN THE ADAPTER AND PC BOARD

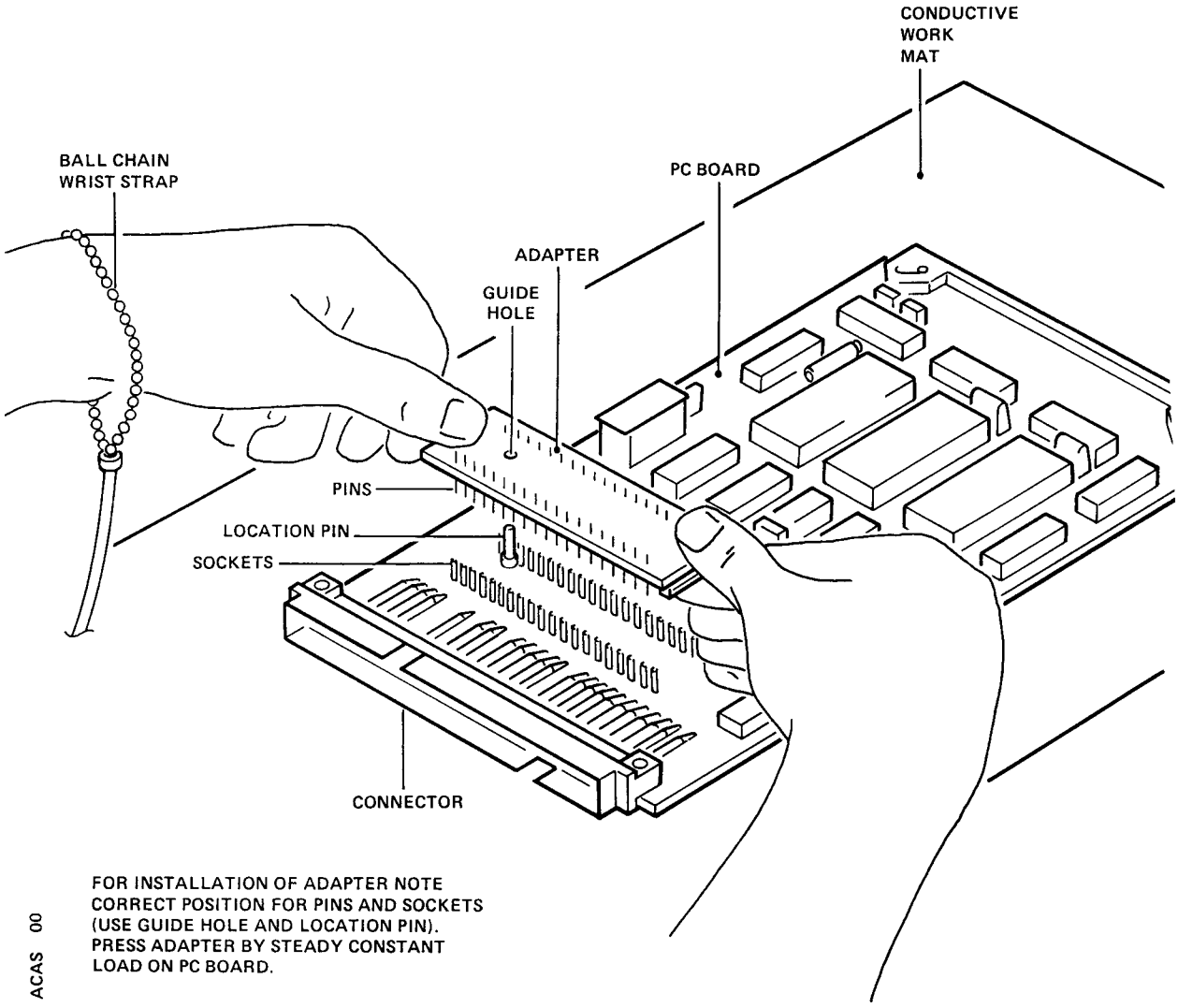



NOTE: USING A ROCKING MOTION REMOVE CAREFULLY

BM6 23 43 11 4 ACAJ 00

PC Board Adapter (Sheet 2/3)
Figure 402

R




BM6 23 43 11 4 ACAS 00

PC Board Adapter (Sheet 3/3)
Figure 402

R

R **ON A/C 001-100,

B. Procedure
(1)Job Set-Up
(a)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | CALLS CABIN | 1RM | J 7 |
| 22VU | COM PASSENGER ADDRESS | 5RY | B15 |
| 800VU | CALL SYSTEM PASS | 1LN | E13 |
| 811VU | CALL SYSTEM PASSENGER | 27LN | B14 |

R **ON A/C 101-200,

R B. Procedure
R (1)Job Set-Up
R (a)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | CALLS CABIN | 1RM | J 7 |
| 22VU | COM PASSENGER ADDRESS | 5RY | B15 |
| 800VU | CALL SYSTEM LAV | 4LN | E12 |
| 811VU | CALL SYSTEM LAVATORY | 29LN | B16 |

R **ON A/C ALL

(b)Position stepladder.
(c)Open relevant ceiling panels (Ref. 25-23-11, P. Block 401) to gain access to junction box.
(d)Place conductive mat in work area adjacent to the faulty junction box and connect the mat to ground.
(e)Connect one hand to ground by antistatic wrist straps.
(2)Removal
(a)Open relevant relay box.
(b)Pull out faulty PCB without touching the Integrated Circuits (IC's).
(c)Place removed PCB on the conductive work mat.
NOTE: Remove adapter (if mounted) from faulty PCB and install it on new PCB.

R **ON A/C 001-100,

(3)Installation
(a)Insert new PCB without touching the ICs.
(b)Close junction box.
(c)Remove all antistatic equipment.

R **ON A/C 101-200,

R (3)Installation
R CAUTION : DO NOT TOUCH THE IC'S ON PRINTED CIRCUIT BOARD (PCB).
R NOTE : Before inserting the Status-Coder-Decoder or Status-Coder PCB'S,
R verify the setting of the DIP-switches as follows:

| STATION | STATUS CODER-DECODER ON - | STATUS CODER-DECODER SWITCH - OPEN | STATUS DECODER ON - | STATUS DECODER SWITCH - OPEN |
|---|---|---|---|---|
| CAPTAIN | - | 1, 2, 3, 4, 5, 6, 7 | - | 1, 2, 3, 4, 5, 6 |
| PURSER | 7 | 1, 2, 3, 4, 5, 6 | - | 1, 2, 3, 4, 5, 6 |
| ATTENDANT 1 R | 7 | 1, 2, 3, 4, 5, 6 | - | 1, 2, 3, 4, 5, 6 |
| ATTENDANT 2 L/R | 7 | 1, 2, 3, 4, 5, 6 | - | 1, 2, 3, 4, 5, 6 |
| ATTENDANT 3 L/R | 7 | 1, 2, 3, 4, 5, 6 | - | 1, 2, 3, 4, 5, 6 |

R (a)Insert new PCB without touching the IC's.
R (b)Close junction Box.
R (c)Remove all antistatic equipment.

R **ON A/C ALL

(d)Remove safety clips and tags and close circuit breakers, opened in step B.(1)(a):

C. Test
(1)Connect aircraft electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Carry out test procedures (Ref. 23-43-00, P. Block 501 and 23-31-00, P. Block 501).

D. Close-Up
(1)Close relevant ceiling panel (Ref. 25-23-11, P. Block 401).
(2)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(3)De-energize aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

# PASSENGER COMPARTMENT - HANDSET CRADLE - REMOVAL/INSTALLATION

## 1. Reason for the Job

A. Replacement of HANDSET CRADLE

WARNING : USE THE ADHESIVE ONLY IN AN AREA WITH A GOOD SUPPLY OF AIR.
OBEY THE MANUFACTURERS INSTRUCTIONS. PUT ON PROTECTIVE CLOTHING.
- DO NOT SMOKE AND/OR BREATHE THE GAS
- THE ADHESIVE WILL BE POISONOUS AND FLAMMABLE.

WARNING : USE THE APPROVED HAND AND EYE PROTECTION WHEN YOU APPLY THE ADHESIVE.

WARNING : IF YOU GET THE ADHESIVE ON YOUR SKIN OR IN YOUR EYES:
- FLUSH AWAY WITH CLEAN WATER
- IF NECESSARY GET MEDICAL AID.

## 2. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Stepladder 2.0 m (7 ft.) |
| (2) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| (3) | Blanking Caps |
| (4) | Circuit Breaker Safety Clips and Tags |
| (5)Material No. 08-007 | Adhesive (Ref. 20-31-00) |
| Referenced Procedures | |
| - 23-31-00, P. Block 501 | Passenger Address System |
| - 23-43-00, P. Block 501 | Cabin and Flight Crew Call System |
| - 23-44-00, P. Block 501 | Cabin and Service Interphone |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 25-23-11, P. Block 401 | Ceiling Panels |
| - 25-23-41, P. Block 401 | Door Frame Linings |

## 3. Procedure

A.Job Set-Up
(1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | CALLS CABIN | 1RM | 101/J 7 |
| 22VU | COM PASSENGER ADDRESS | 5RY | 208 B15 |
| 22VU | AUDIO SYS/INTPH AMPL/SVCE | 20RJ | 205/E17 |

**ON A/C 101-200,

(Ref. Fig. 401)

**ON A/C 001-100,

(Ref. Fig. 402)

**ON A/C 101-200,

(2)Open relevant ceiling panels (Ref. 25-23-11, P. Block 401) to gain access to connector 5853VC above LAV T (connector 5852VC above LAV W).

**ON A/C ALL

B. Removal of handset cradle
(1)Unclip snap-fitted covers (1, 2).
(2)Remove screws (5) and washers (4).
NOTE : Upper attachment screws are accessible after pressing pushbuttons.
(3)Withdraw interphone panel (3) from position until electrical connector (6) is accessible.
(4)Disconnect electrical connector (6) and remove interphone panel (3).

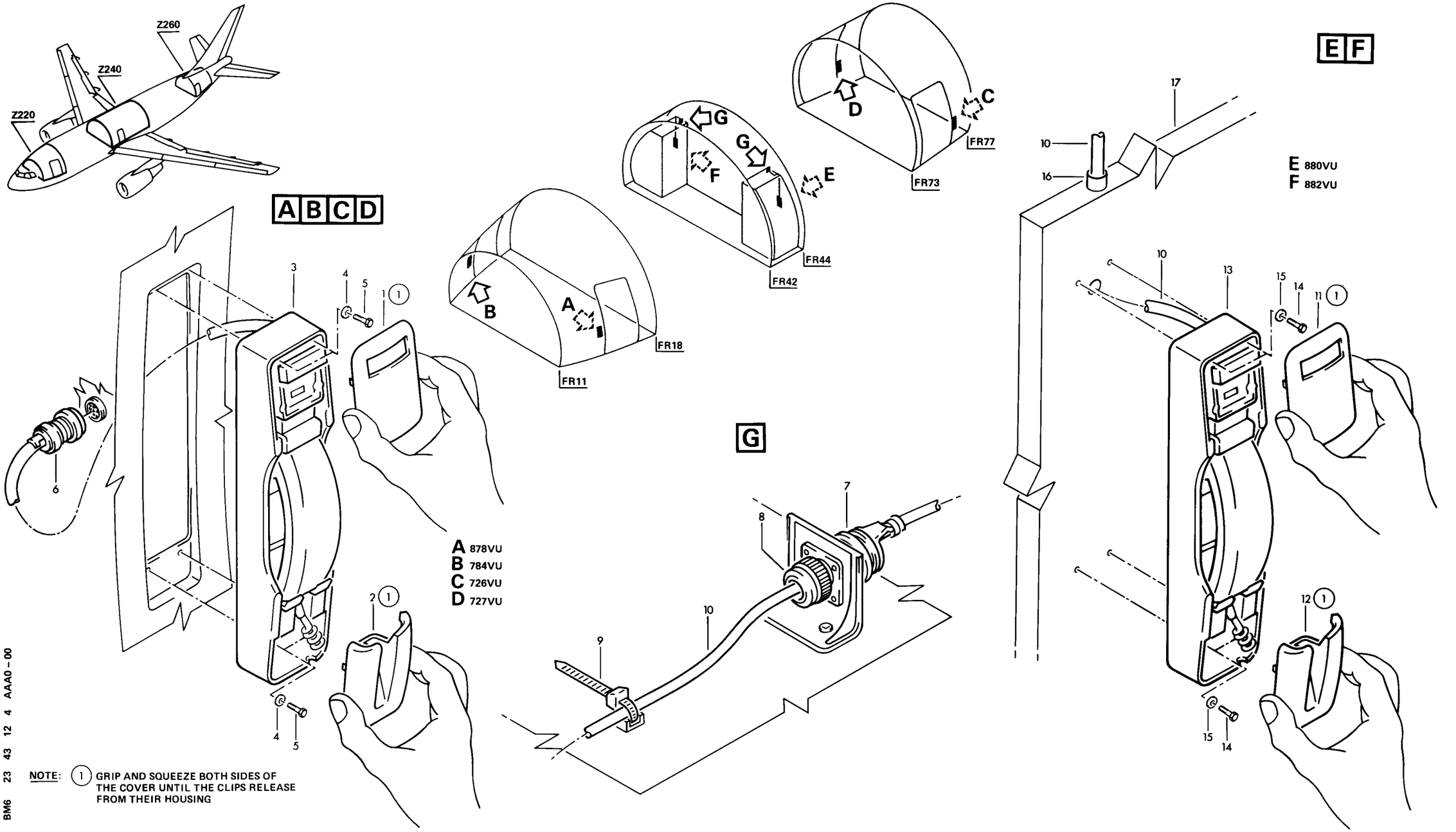
C. Installation of handset cradle
(1)Connect electrical connector (6) and position handset-cradle (3).
(2)Install handset-cradle, use existent screws (3) and washers (4).
NOTE : Upper attachment screws are accessible after pressing pushbuttons.

NOTE : If HOLMBERG handsets/cradles (89-01-XXXXX-16) are installed, put a drop of adhesive (Mat. No. 08-007) into the threaded inserts of the handsets housing back and the support brackets base plate.

(3)Install covers (1, 2), press cover until snapped in position.
(4)Remove safety clips and tags and close circuit breaker 1RM, 5RY and 20RJ.

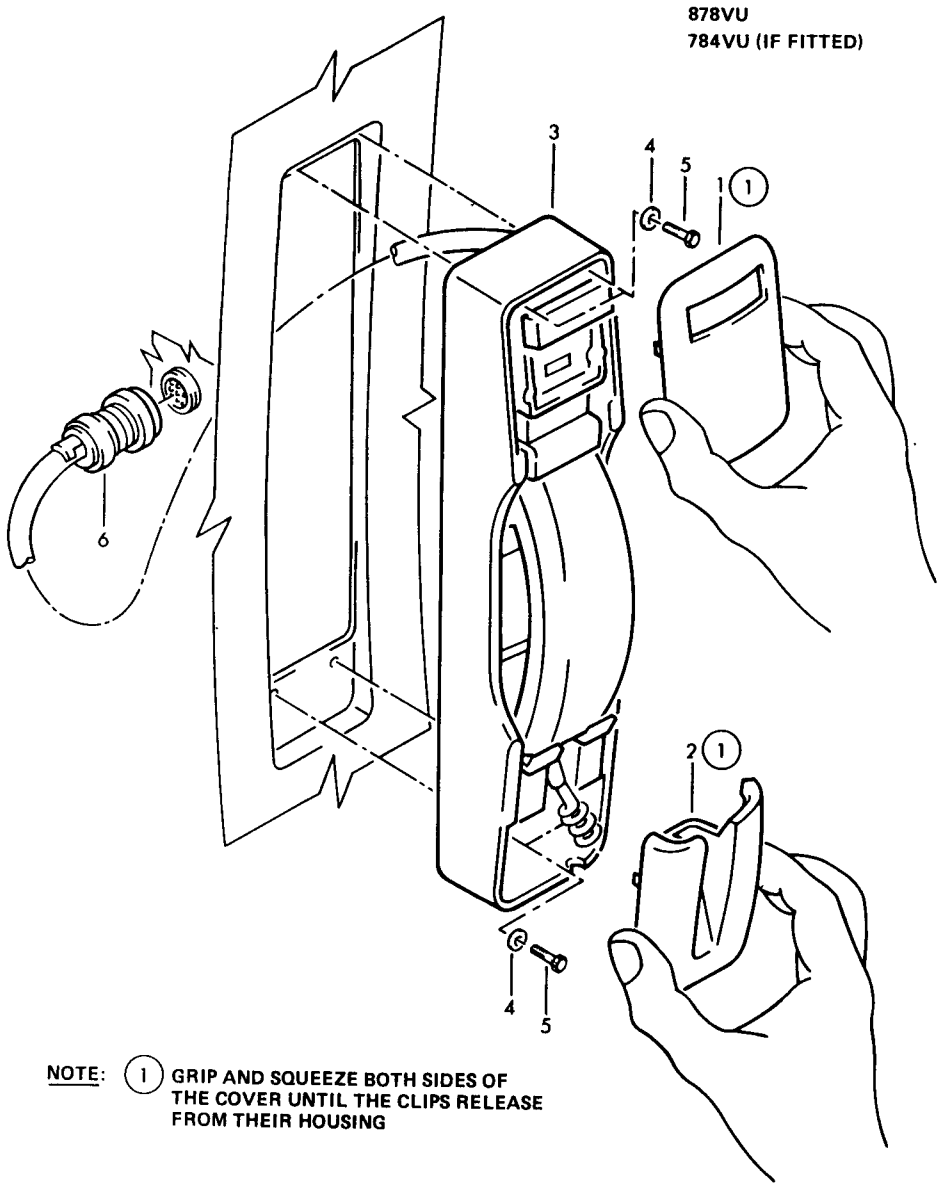
R

R D. Test after removal/installation of handset cradle.
(1)Connect aircraft electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Carry out adjustment/test of cabin and service interphone (Ref. 23-44-00 P. Block 501), cabin and crew call system (Ref. 23-43-00 P. Block 501 and passenger address system (Ref. 23-31-00 P. Block 501), particularly where handset is concerned.
- establish voice communications between the exchanged and the various other stations (using hand microphone and handset), service interphone jacks (using ground service telephone) and cabin attendant stations.




BM6 23 43 12 4 AAA0-00

HANDSET - CRADLE ASSY
Figure 401




BM6 23 43 12 4 AAB0 00

HANDSET - CRADLE ASSY
Figure 402

R E. Close-Up

(1)Close relevant ceiling panel (Ref. 25-23-11, P. Block 401).

(2)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(3)Remove stepladder.

(4)De-energize aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

1. General

The cabin and service interphone system allows telephone communications between :

- the flight compartment and the various Cabin Attendants' stations
- the Cabin Attendants' stations
- the flight compartment and the various service interphone jacks on the aircraft
- the various Cabin Attendants' stations and the service interphone jacks
- the various service interphone jacks.

2. Component Location

**ON A/C ALL

R Post SB 23-2082 For A/C 101-104,

(Ref. Fig. 001)

**ON A/C 101-200,

(Ref. Fig. 002)

**ON A/C 001-100,

(Ref. Fig. 003)

**ON A/C 101-200,

(Ref. Fig. 004)

**ON A/C ALL

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 1RJ | JACK-SVCE INTPH | | 110 | | |
| 2RJ | JACK-SVCE INTPH | 108VU | 120 | 121EL | |
| 3RJ | JACK-SVCE INTPH | | 121 | | |
| 4RJ | JACK-SVCE INTPH | 906VU | 132 | | |
| 5RJ | JACK-SVCE INTPH | | 136 | | |
| 6RJ | JACK-SVCE INTPH | | 144 | | |
| 7RJ | JACK-SVCE INTPH | | 143 | | |
| 8RJ | JACK-SVCE INTPH | | 691 | | |
| 9RJ | JACK-SVCE INTPH | | 591 | | |
| 10RJ | JACK-SVCE INTPH | | 147 | | |
| 11RJ | JACK-SVCE INTPH | | 152 | | |

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 12RJ | JACK-SVCE INTPH | 862VU | 162 | | |
| 13RJ | JACK-SVCE INTPH | | 312 | | |
| 14RJ | JACK-SVCE INTPH | | 313 | | |
| 15RJ | SWITCH-SVCE INTPH JACKS | 419VU | 211 | | |
| 23RJ | HANDSET-PURSER | 878VU | 221 | | |
| **ON A/C 101-200, | | | | | |
| 24RJ | HANDSET-EMER EXIT ATTND | 882VU | 242 | | |
| 25RJ | HANDSET-EMER EXIT ATTND | 880VU | 241 | | |
| **ON A/C ALL | | | | | |
| 26RJ | HANDSET-AFT ATTND | 726VU | 262 | | |
| 27RJ | HANDSET-AFT ATTND | 727VU | 261 | | |
| **ON A/C 101-200, | | | | | |
| 33RJ | SWITCH-INTPH COUPLING | 414VU | 212 | | |
| **ON A/C ALL | | | | | |
| 44RJ | HANDSET-FWD ATTND | 784VU | 222 | | |
| **ON A/C 001-100, | | | | | |
| 59RJ | HANDSET-FWD ATTND | 1308VU | 230 | | 23-44-00 |
| **ON A/C ALL | | | | | |

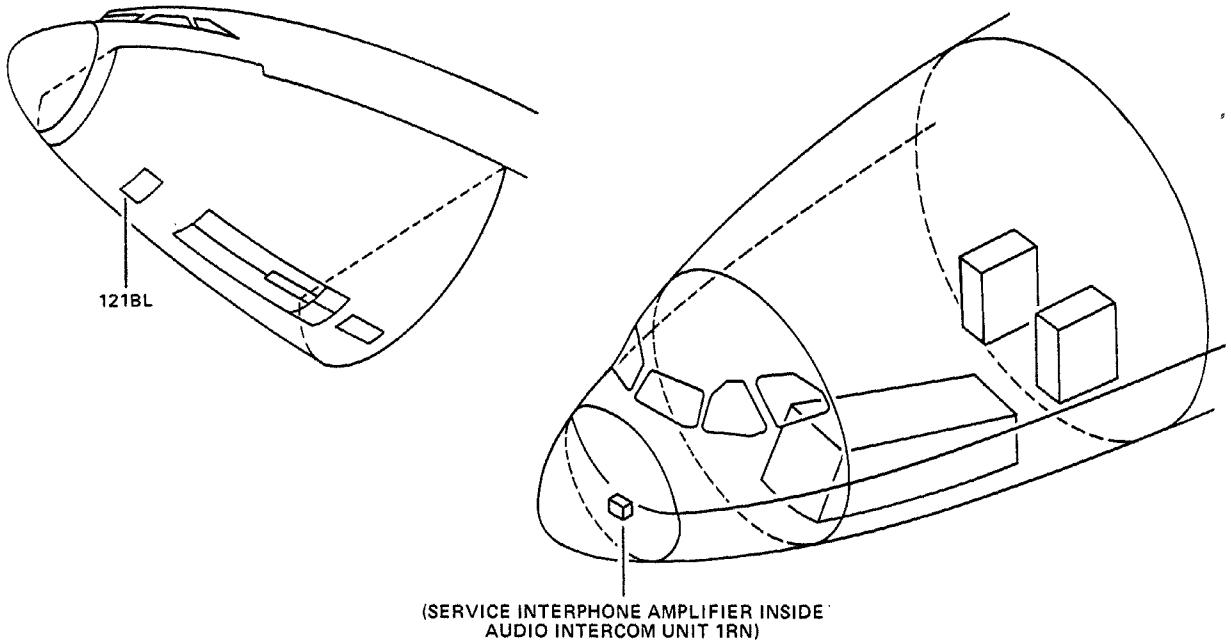
R Post SB 23-2082 For A/C 101-104,

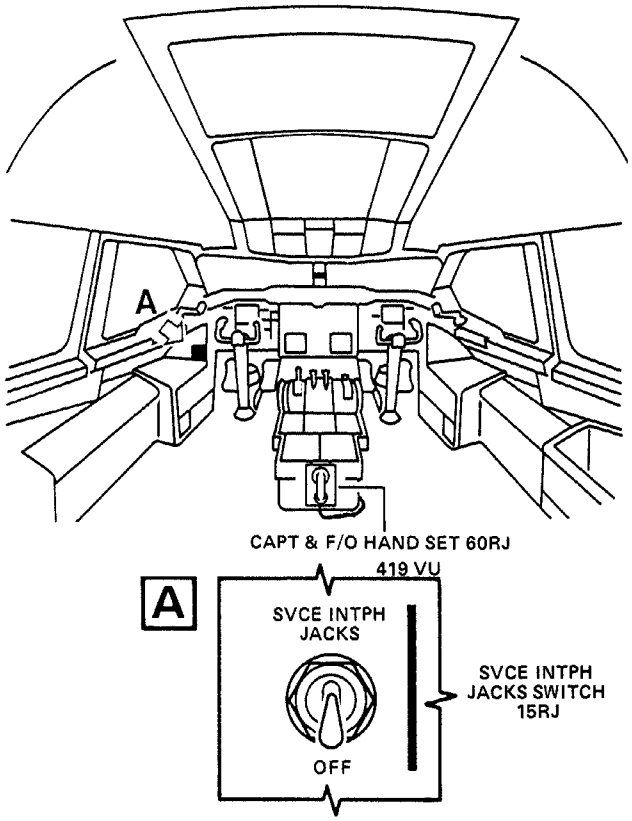
| | | | | | |
|---|---|---|---|---|---|
| 60RJ | CAPT & F/O-HANDSET | 11VU | 210 | | |
| **ON A/C ALL | | | | | |
| 1RN | AUDIO INTERCOM UNIT | | 121 | 121BL | 23-51-18 |

3. System Description
   The system consists of :
   - an amplifier located inside the audio intercommunication unit.

**ON A/C ALL

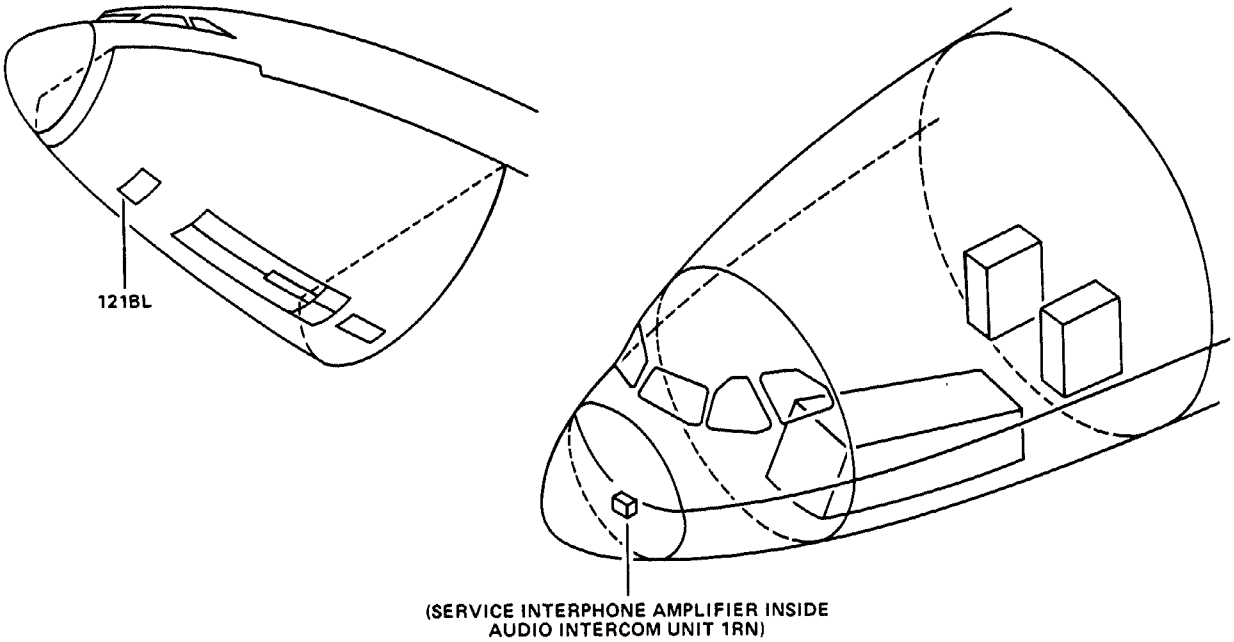
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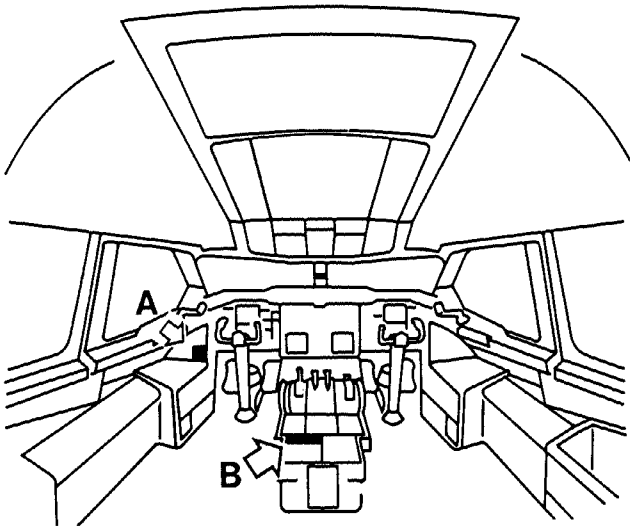


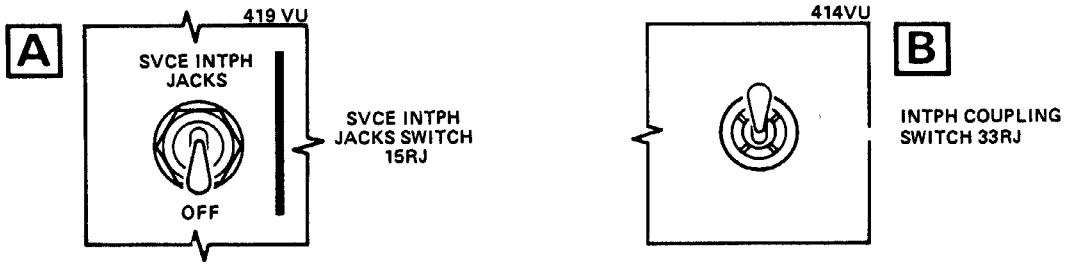




BM5 23 44 00 0 TGA0 00

Service Interphone - Component Location
Figure 001



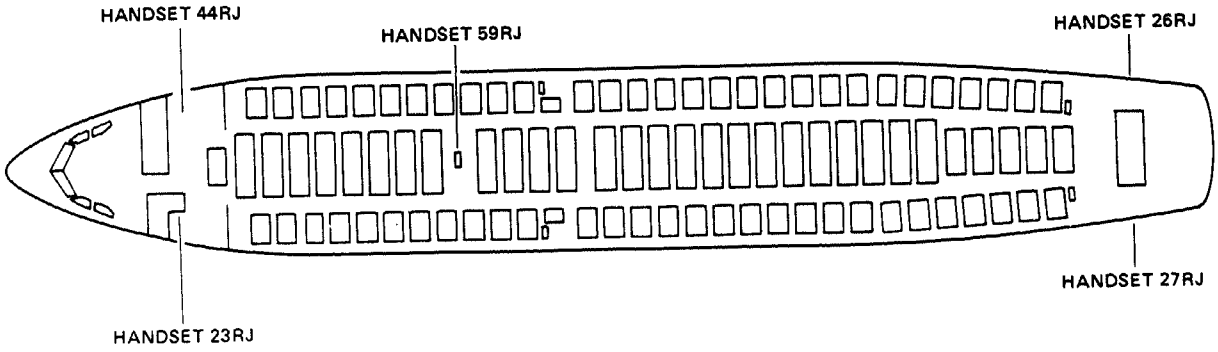



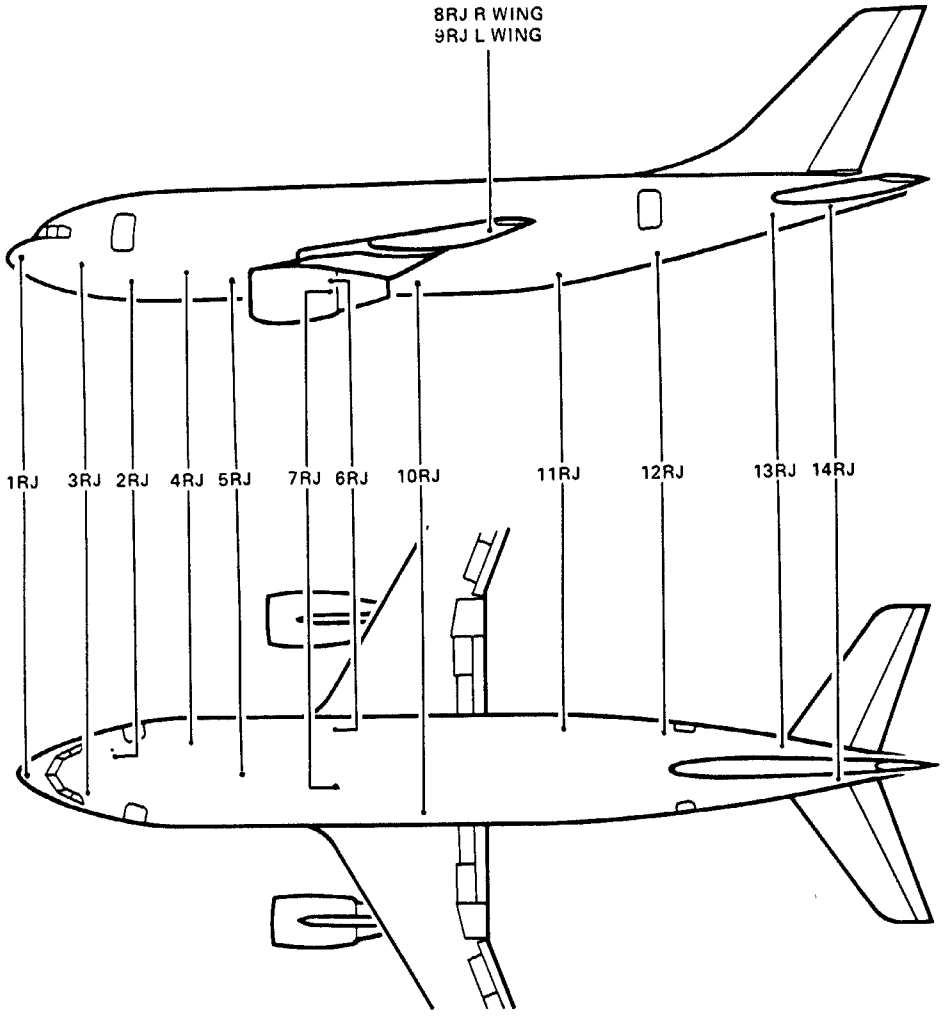

BM5 23 44 00 0 HFT0 00

Service Interphone - Component Location
Figure 002

R

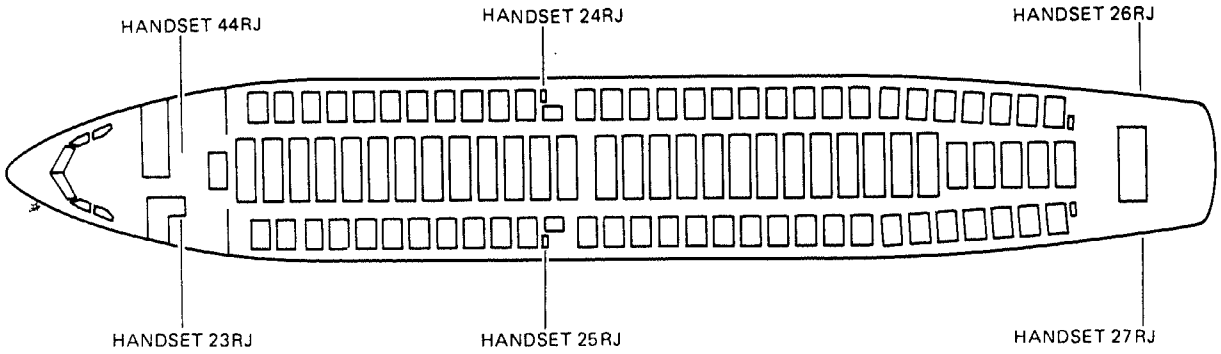



SERVICE INTERPHONE - LOCATION OF SERVICE INTERPHONE HANDSETS

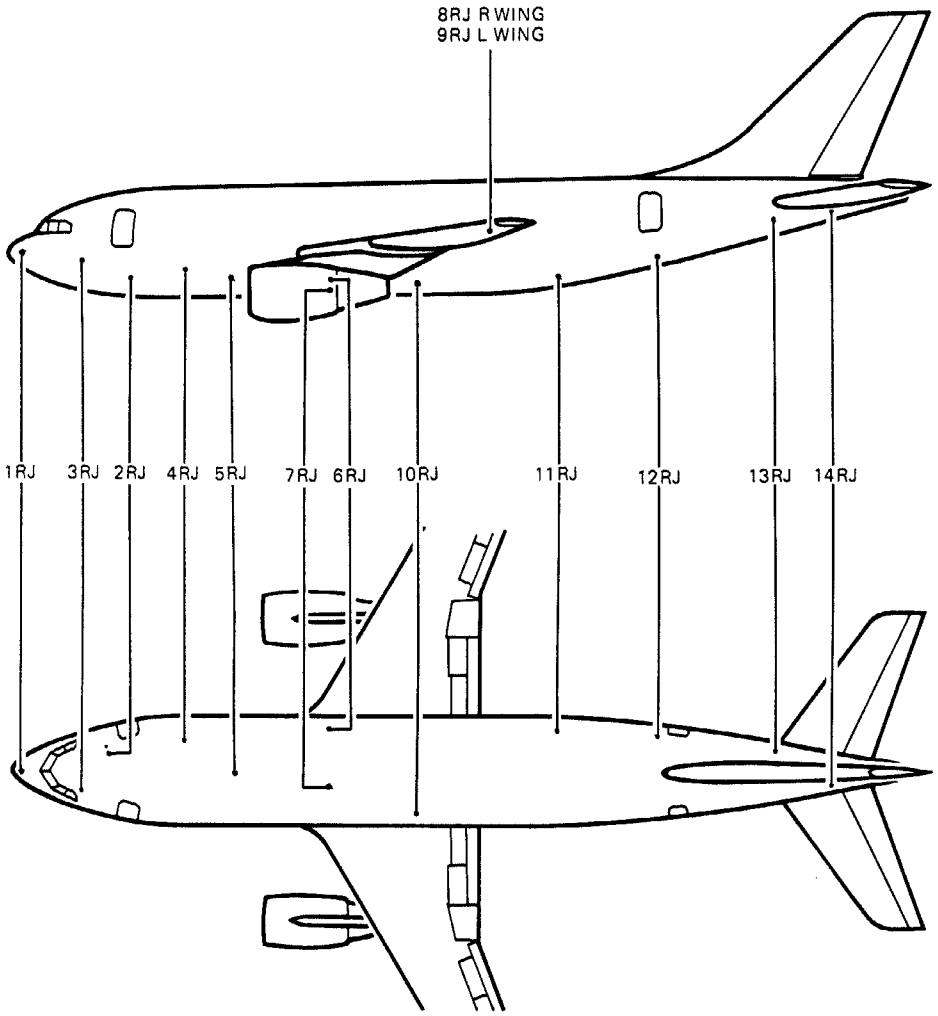



BM5 23 44 00 0 EKM0 00

Location of Service Interphone Jacks
Figure 003




SERVICE INTERPHONE–LOCATION OF SERVICE INTERPHONE HANDSETS




BM5 23 44 00 0 ACN0 00

Location of Service Interphone Jacks
Figure 004

R

- handset - INTPH/PA in cockpit

**ON A/C ALL

- relays in circuit RJ (Service interphone)
- relays in circuit RY (Public address)
- telephone handsets (passenger compartment)
  (Ref. Block Diagram of para. System Architecture)
- fourteen service interphone jacks installed in various parts of the aircraft
- two additional jacks with the same characteristics located on the engine cowls
- a SVCE INTPH JACKS selector switch.

The cabin and service interphone system is also connected to the passenger address system (23-31).

4. Electrical Power Supply

The service interphone system is supplied with 28VDC from ultimate emergency busbar 3PP by busbar 303PP through 3A circuit breaker 20RJ located on circuit breaker panel 22VU (205).
(Ref. Fig. 005)

5. Operation

**ON A/C 001-100,

(Ref. Fig. 006)

R **ON A/C 105-200,

R (Ref. Fig. 007)

**ON A/C 101-200,

(Ref. Fig. 008)

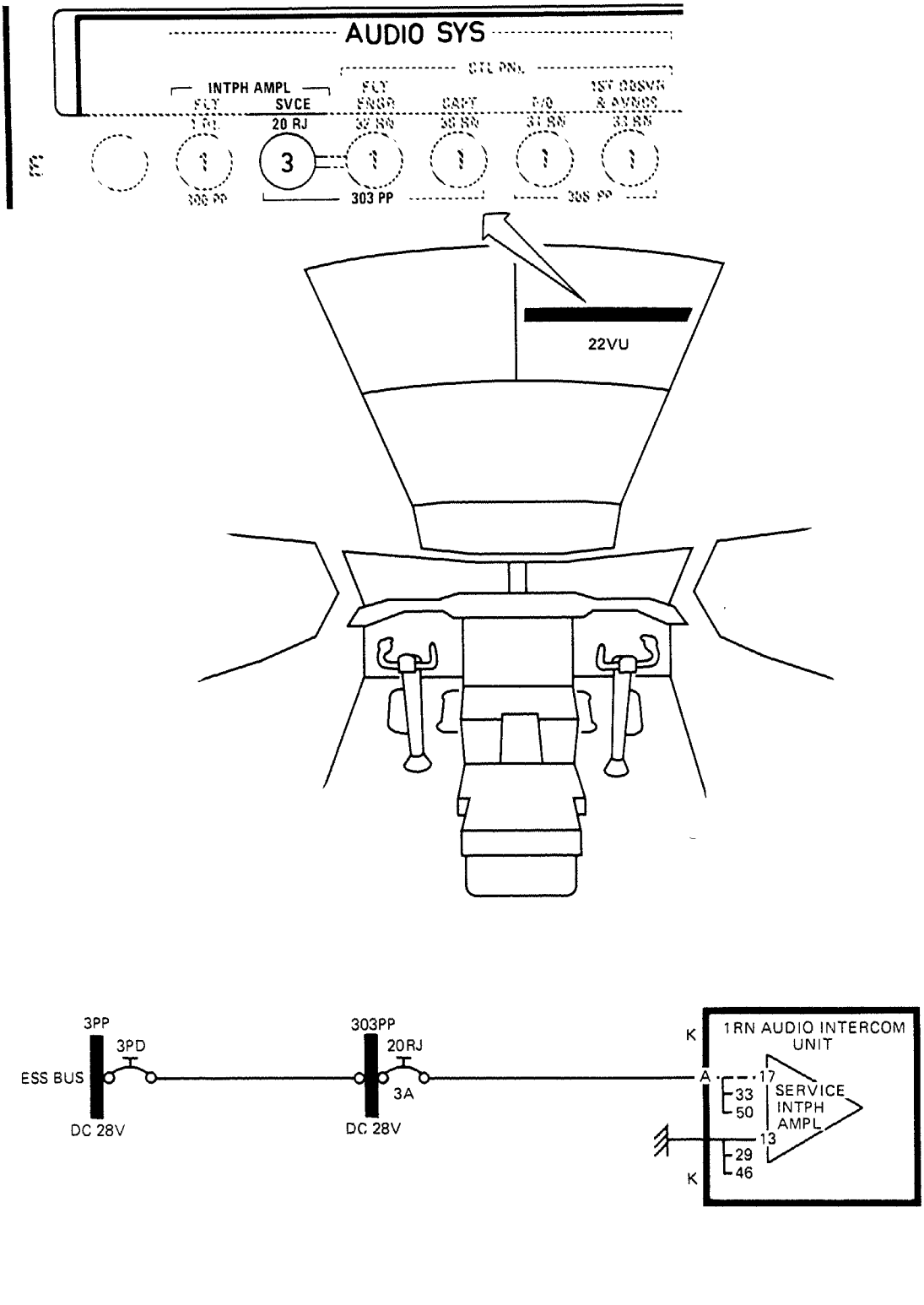
R **ON A/C 101-104,

R Post SB 23-2082 For A/C 101-104,

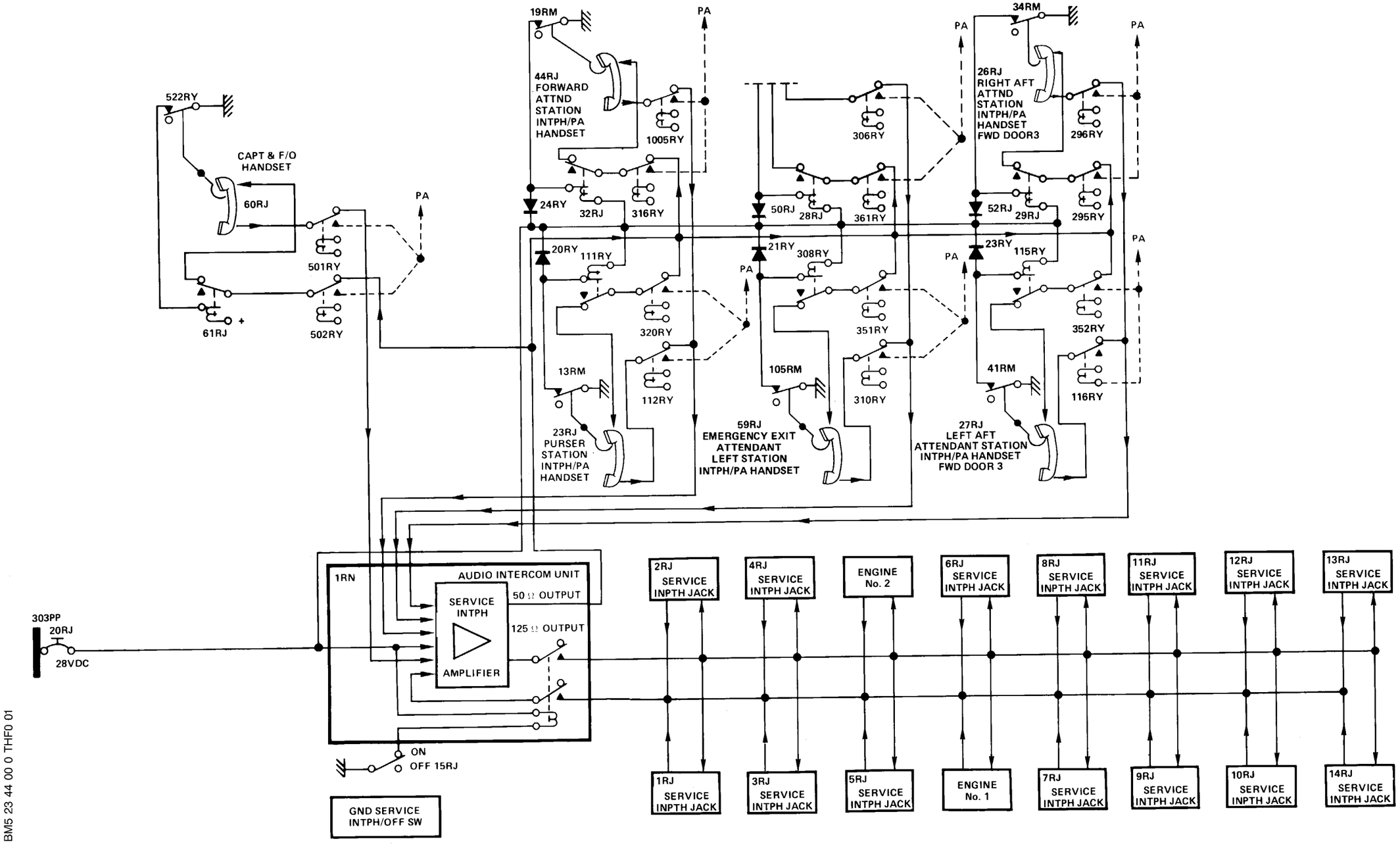
(Ref. Fig. 009)

**ON A/C 101-200,

All the microphone signals from the various electro-acoustic equipment at flight compartment crew member station (boomsets, oxygen masks, hand microphones), Cabin Attendants' station and ground service acoustic equipment connected to the service interphone jacks are fed to the service interphone amplifier. The amplifier AF output signal is sent back to the components previously mentioned.




Service Interphone - Electrical Power Supply
Figure 005

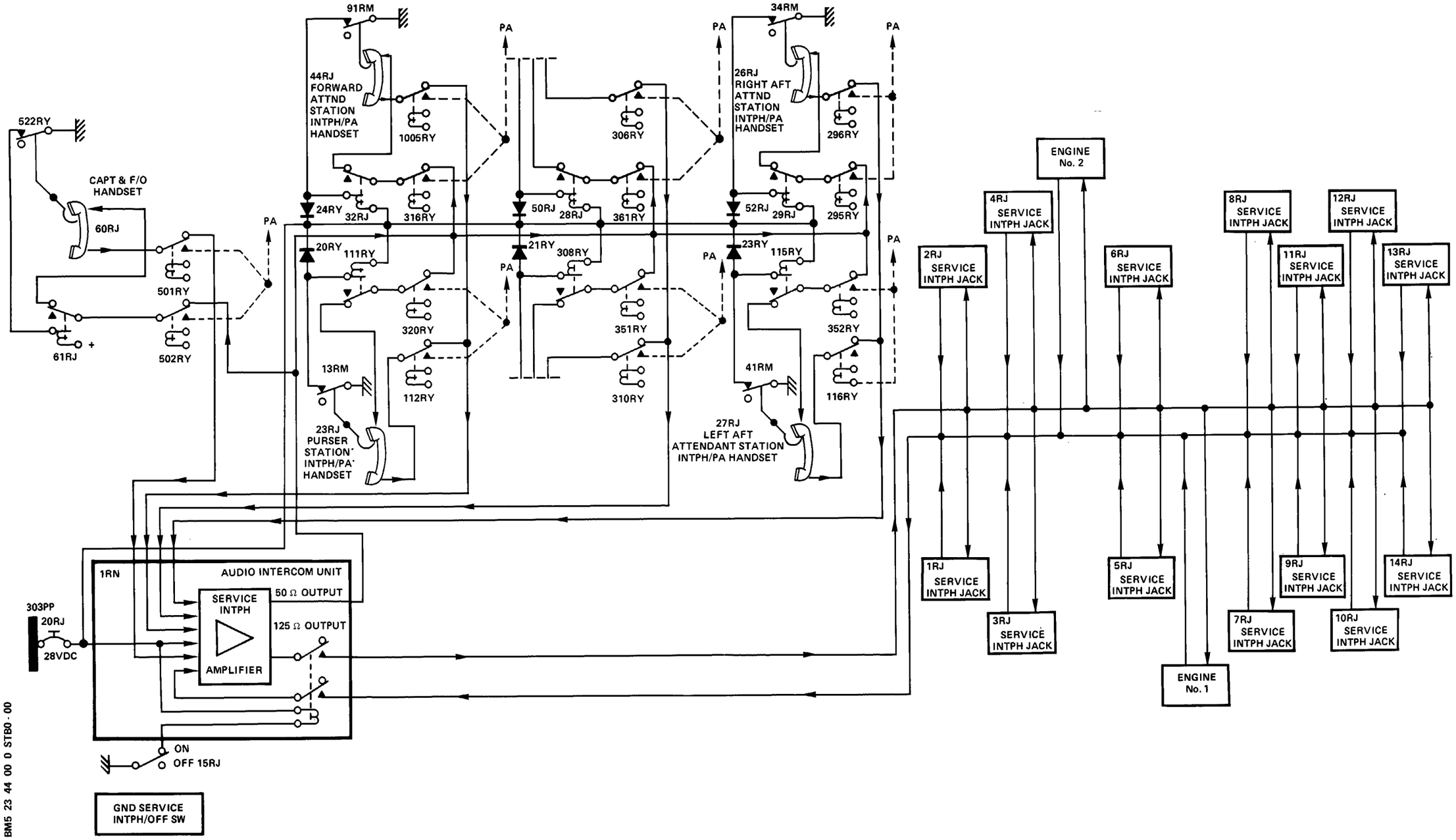



BM5 23 44 00 0 THF0 01

Service Interphone - Block Diagram
Figure 006

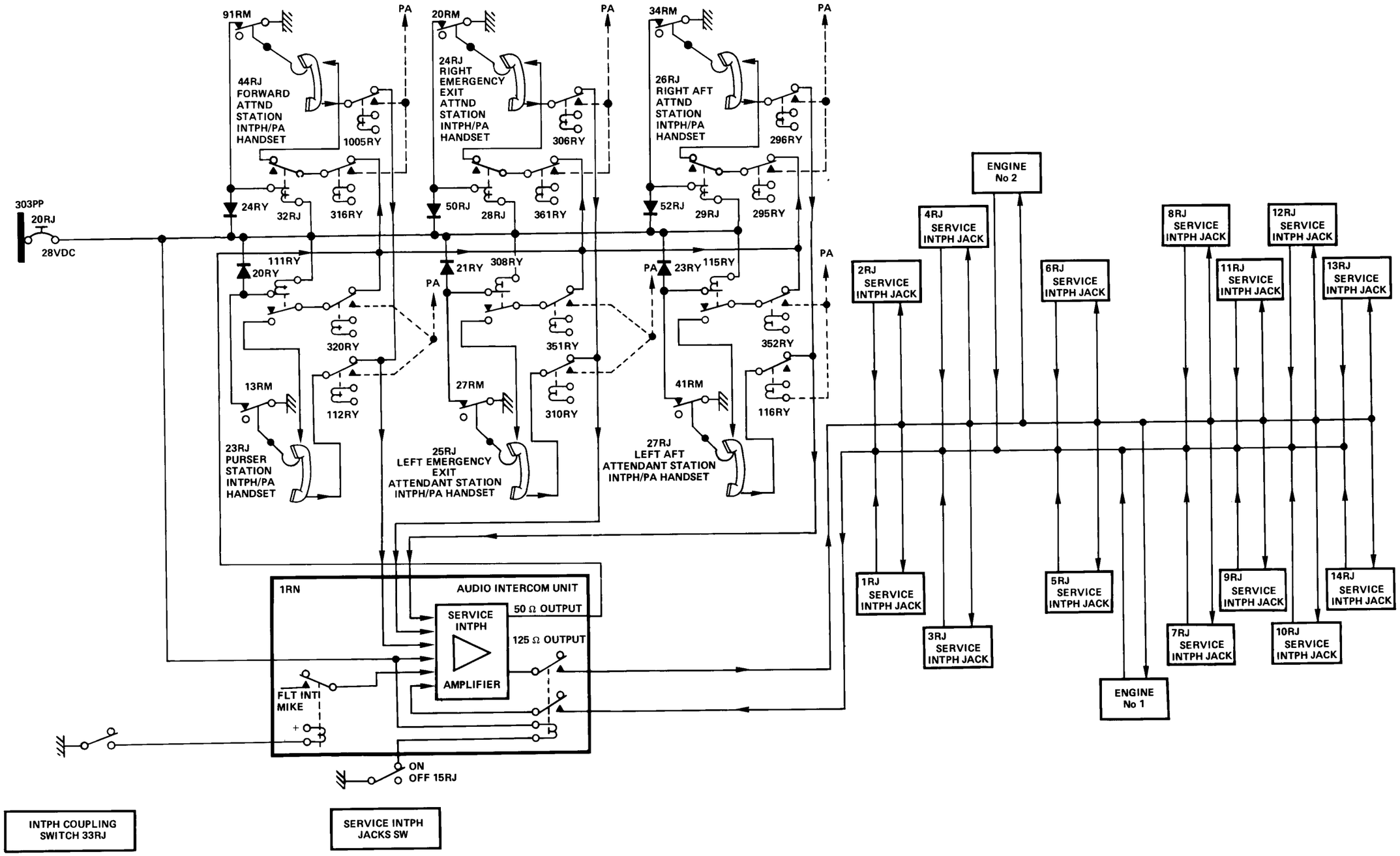
R EFFECTIVITY: 001-100,

PIA



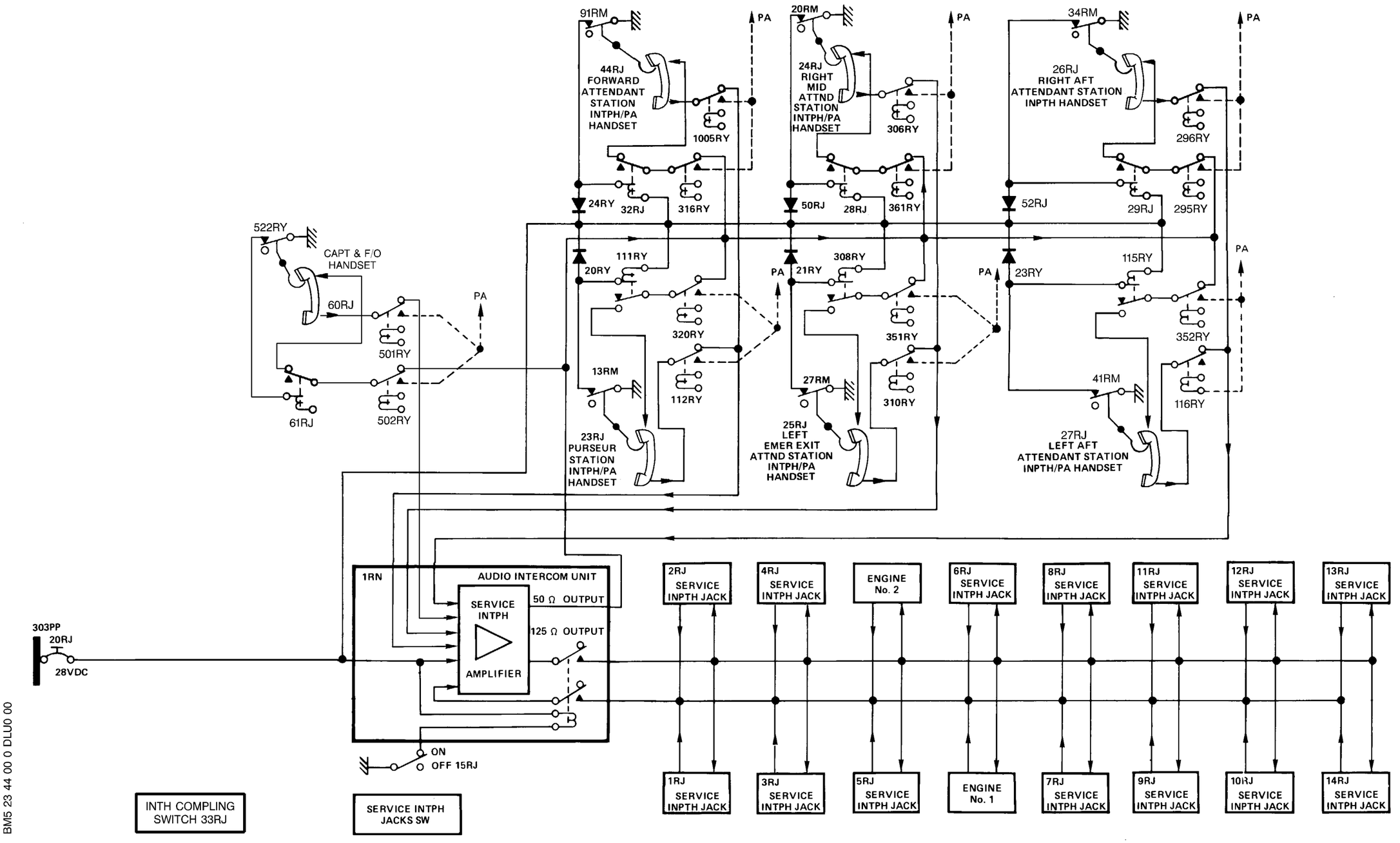

BM5 23 44 00 D STB0 - 00

Service Interphone - Block Diagram
Figure 007




BM5 23 44 00 0 DLT0 00

Service Interphone - Block Diagram
Figure 008




BM5 23 44 00 0 DLU0 00

Service Interphone - Block Diagram
Figure 009

R EFFECTIVITY: 101-104,

PIA



Printed in France

R **ON A/C 001-100, 105-200,

All the microphone signals from handsets at flight compartment crew member station, Cabin Attendants' stations and ground service acoustic equipment connected to the service interphone jacks are fed to the service interphone amplifier. The amplifier AF output signal is sent back to the components previously mentioned.

R **ON A/C 101-104,

R Post SB 23-2082 For A/C 101-104,

All the microphone signals from the various electro-acoustic equipment at flight compartment crew member station (boomsets, oxygen masks, hand microphones, handset), Cabin Attendants' station and ground service acoustic equipment connected to the service interphone jacks are fed to the service interphone amplifier. The amplifier AF output signal is sent back to the components previously mentioned.

**ON A/C ALL

6. Service Interphone Amplifier

A. Description
The service interphone amplifier includes :
- seven independent microphone inputs for the various stations :
  . input impedance : 150 ohms
  . input level : 0.250 V
- two audio outputs : one 125 ohm output for service interphone jacks and one 50 ohm output for Cabin Attendants' stations and flight compartment
  . maximum output power : 125 mW on both outputs.

The electronic part consists of two amplifier stages, two regulated power supplies and a network coupling relay.

B. Operation
(Ref. Fig. 010)

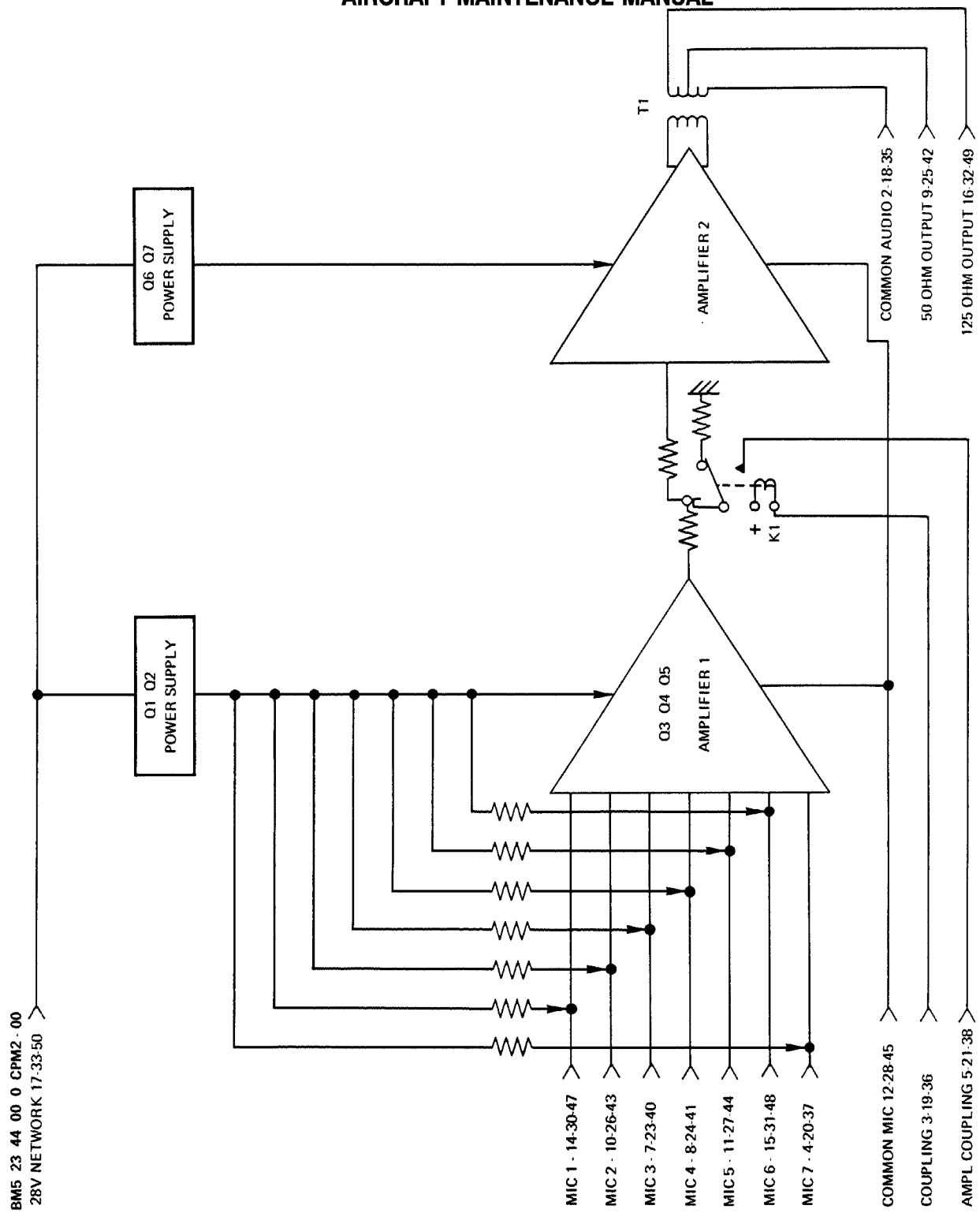
**ON A/C 101-200,

The input signal from the various microphones is applied to inputs 1 to 7 for high points and to the common microphone for low points. On high-point inputs a regulated power supply (transistor Q1 Q2) provides the voltage necessary to the microphone series power supply. The input signal is applied to a first amplifier stage made up of transistors Q3, Q4, Q5 and is then sent to the output stage made up of a built-in circuit and transformer T1. The AF output signal is available on two 50 and 125 ohm impedance outputs. Relay K1 (network coupling relay), between the two amplifier stages, enables, when circuit is utilized, connection of flight interphone and service interphone amplifiers.

**ON A/C ALL

R Post SB 23-2082 For A/C 101-104,

The input signal from the various microphones is applied to inputs 1 to 7 for high points and to the common microphone for low points. On high-point inputs a regulated power supply (transistor Q1 Q2) provides the voltage necessary to the microphone series power supply. The input signal is applied to a first amplifier stage made up of transistors Q3, Q4, Q5 and is then sent to the output stage made up of a built-in circuit and transformer T1. The AF output signal is available on two 50 and 125 ohm impedance outputs. For information, relay K1 (network coupling relay), between the two amplifier stages, enables, when circuit is utilized, connection of flight interphone and service interphone amplifiers only when an interphone coupling switch is installed.




Service Interphone Amplifier
Figure 010

**ON A/C ALL

7. Not Applicable

8. Not Applicable
9. Service Interphone Jacks

A. Description
The service interphone jacks enable connection of ground service acoustic equipment at various parts of the aircraft. They are located either directly on the aircraft structure or on mounts. These jacks are connected to the service interphone amplifier through the contacts of the relay located inside the audio intercommunication unit.

B. Operation
When the SVCE INTPH JACKS switch is placed in JACKS position the relay is energized thus enabling connection of the sixteen service interphone jacks into the system.
The reception signals from the service interphone amplifier (125 ohm output) are fed to the ground service acoustic equipment through a closed contact of the relay. The signals from the ground service acoustic equipment microphones are fed to one input of the service interphone amplifier (input No.7) through a closed contact of the relay.

1. Operational Test

A. Reason for the Job
To check voice communication establishment between any two stations.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Ground Service Telephone - 150 ohm Micro (High Level), 600 ohm Earphones |
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.

CAUTION : ALL SAFETY PRECAUTIONS MUST BE OBSERVED DURING REMOVAL/INSTALLATION OF ENGINE JACKS OPERATION.
SUCTION AT THE AIR INLET IS SUFFICIENT TO KILL OR SERIOUSLY INJURE PERSONNEL BY DRAWING THEM SUDDENLY INTO OR AGAINST THE AIR INTAKE. THE HIGH TEMPERATURE, VELOCITY AND OVERPRESSURE (ABOVE ATMOSPHERIC) WITHIN THE EXHAUST GAS WAKE IS ALSO EXTREMELY DANGEROUS.

(1)Job set-up
(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)Close overhead panel circuit breakers, particularly those associated with AUDIO SYS, COM and CALLS systems.

(2)Test

| ACTION | RESULT |
|---|---|
| 1. On Captain's console, on panel 419VU<br>- place SVCE INTPH JACKS switch in ON position. | |

R **ON A/C 001-104,

R Post SB 23-2082 For A/C 101-104,

2. On audio control panel of each crew member station
- engage INT transmission key
- disengage INT reception pushbutton, adjust reception level.

| ACTION | RESULT |
|---|---|
| **ON A/C 101-200, | |
| 2. On panel 414VU<br>- place INTPH COUPLING switch in ON position. | |
| 3. Establish voice communications between any differents stations (using hand microphone and headset), service interphone jacks (using ground service telephone) and Cabin Attendant stations. | - check quality of communications. |
| R **ON A/C 001-100, 105-200, | |
| 3. Establish voice communications between any different stations (using handset of Cockpit station), service interphone jacks (using ground service telephone) and Cabin Attendant stations. | - check quality of communications. |
| R **ON A/C 101-104, | |
| R Post SB 23-2082 For A/C 101-104, | |
| 3. Establish voice communications between any different stations (using hand microphone, headset and pedestal handset), service interphone jacks (using ground service telephone) and Cabin Attendant stations. | - check quality of communications. |
| **ON A/C ALL | |
| (3)Close-up<br>(a)On Captain's console, on panel 419VU, place SVCE INTPH JACKS switch in OFF position. | |
| R **ON A/C 001-104, | |

R Post SB 23-2082 For A/C 101-104,

(b)On audio control panels
- disengage INT transmission key
- engage INT reception pushbutton.

(c)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(d)Remove all ground handling and maintenance equipment, standard and special tools, together with ground power equipment, all access equipment and miscellaneous items.

**ON A/C 101-200,

(b)On panel 414VU, place INTPH COUPLING switch in OFF position.

(c)On audio control panels
- disengage INT transmission key
- engage INT reception pushbutton.

(d)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(e)Remove all ground handling and maintenance equipment, standard and special tools, together with ground power equipment, all access equipment and miscellaneous items.

# MAINTENANCE INTERPHONE JACK - REMOVAL/INSTALLATION

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Torque Wrench 8 to 120 lbf.in. (0.09 m.daN to 1.35 m.daN) |
| B. | Blanking Caps |
| C. | Circuit Breaker Safety Clips |
| Referenced Procedure - 23-44-00, P. Block 501 | Cabin and Service Interphone |

## 2. Procedure

(Ref. Fig. 401)

A. Job Set-Up

CAUTION : ALL SAFETY PRECAUTIONS MUST BE OBSERVED DURING REMOVAL/INSTALLATION OF ENGINE JACKS.
SUCTION AT THE AIR INLET IS SUFFICIENT TO KILL OR SERIOUSLY INJURE PERSONNEL BY DRAWING THEM SUDDENLY INTO OR AGAINST THE AIR INTAKE. THE HIGH TEMPERATURE, VELOCITY AND OVERPRESSURE (ABOVE ATMOSPHERIC) WITHIN THE EXHAUST GAS WAKE IS ALSO EXTREMELY DANGEROUS.

(1)Open, safety and tag the following circuit breaker

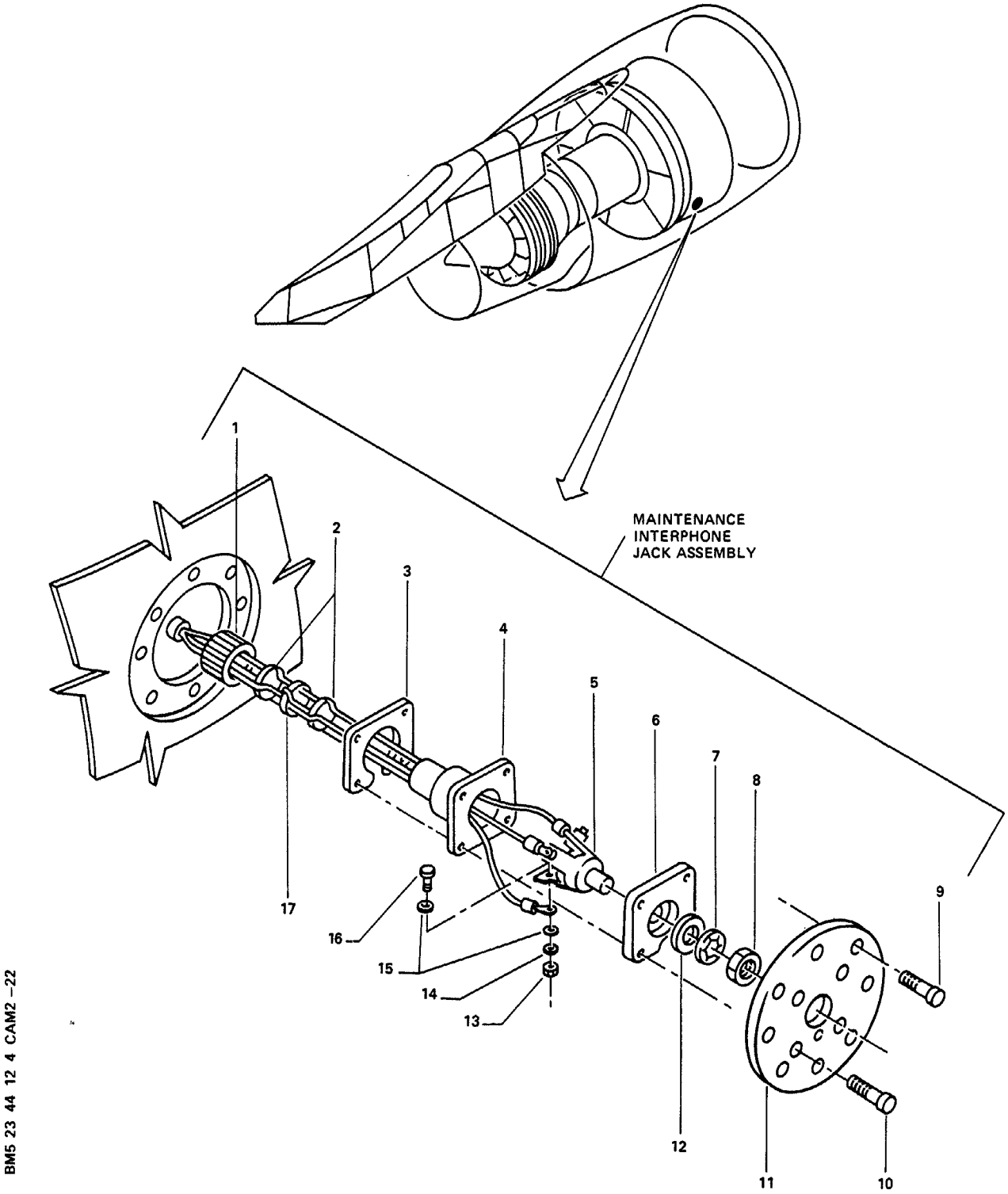
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/INTPH AMPL/SVCE | 20RJ | 205/E17 |

B. Removal

(1)Loosen six outer screws (9) attaching maintenance interphone jack assembly to cover (11).
(2)Remove four inner screws (10) attaching cover to inlet cowl.
(3)Draw jack assembly, cover and wires out of inlet cowl.
(4)Remove screws, retainer (3) and cover (11) from jack assembly.
(5)Remove nut (8), lockwasher (7), washer (12) and mounting plate (6) from jack (5). Discard lockwasher (7).
(6)Unscrew coupling nut (1) holding gland (17) and pressure plates (2) in place and pull jack out of shell (4) exposing electrical connections.
(7)Remove screws (16), washers (15), lockwashers (14) and nuts (13), disconnecting wires from jack. Remove jack (5).
(8)Install blanking caps on jack (5) and exposed wires.

C. Installation

(1)Clean and inspect interphone jack interface and/or adjacent area.
(2)Remove blanking caps from jack (5) and connecting wires and attach wires.
(3)Install screws (16), washers (15), lockwashers (14) and nuts (13) attaching wires to maintenance interphone jack (5). TORQUE nuts to between 20 and 25 lbf.in. (0.226 and 0.2825 m.daN).
(4)Slide shell (4) over jack (5) and wire connections.




Maintenance Interphone Jack
Figure 401

(5)Screw coupling nut (1) on shell holding gland (17), pressure plates (2), and retainer (3) in place. TORQUE nut to between 70 and 75 lbf.in. (0.7909 and 0.8474 m.daN).
(6)Attach mounting plate (6) to jack with nut (8), washer (12)and lockwasher (7). TORQUE nut to between 110 and 120 lbf.in. (1.2428 and 1.3558 m.daN).
(7)Attach cover (11) to mounting plate (6) and retainer (3) with four inner screws (10). TORQUE screws to between 8 and 10 lbf.in. (0.0904 and 0.1130 m.daN).
(8)Insert jack assembly and cover (11) into inlet cowl attaching with six outer screws (9). TORQUE screws to between 20 and 25 lbf.in. (0.226 and 0.2825 m.daN).
(9)Remove safety clip and tag and close circuit breaker 20RJ.

D. Test
Carry out operational test of cabin and service interphone (Ref. 23-44-00, P. Block 501), particularly where interphone jack is concerned.

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

## MAINTENANCE INTERPHONE JACK (D4974J) - REMOVAL/INSTALLATION

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Torque Wrench 110 to 120 lbf.in. (1.24 m.daN to 1.35 m.daN) |
| B. | Blanking Caps |
| C. | Circuit Breaker Safety Clips |

2. Procedure
(Ref. Fig. 401)

A. Job Set-Up

CAUTION : ALL SAFETY PRECAUTIONS MUST BE OBSERVED DURING REMOVAL/INSTALLATION OF ENGINE JACKS.
SUCTION AT THE AIR INLET IS SUFFICIENT TO KILL OR SERIOUSLY INJURE PERSONNEL BY DRAWING THEM SUDDENLY INTO OR AGAINST THE AIR INTAKE. THE HIGH TEMPERATURE, VELOCITY AND OVERPRESSURE (ABOVE ATMOSPHERIC) WITHIN THE EXHAUST GAS WAKE IS ALSO EXTREMELY DANGEROUS.

(1)Open, safety and tag the following circuit breaker

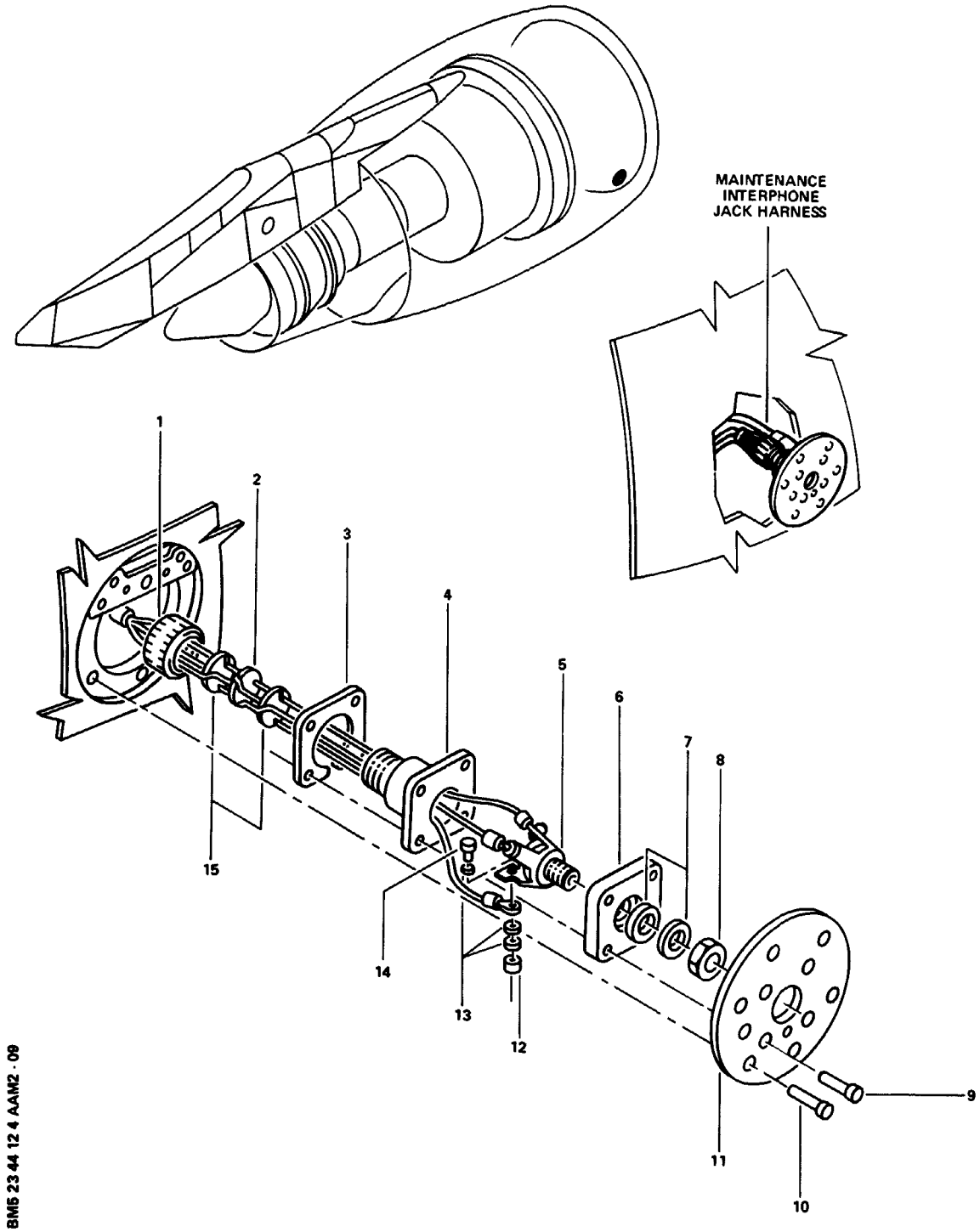
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/INTPH AMPL/SVCE | 20RJ | 205/E17 |

B. Removal

(1)Remove screws (10) attaching access plate (11) to inlet cowl. Pull jack, shell (4) and harness from inside of inlet cowl until slack is removed from harness.
(2)Remove screws (9) attaching insulating plate (6), shell (4) and retainer (3) to access plate and remove access plate (11).
(3)Remove nut (8) and lockwashers (7) attaching jack (5) to insulating plate and remove insulating plate (6). Discard lockwashers (7).
(4)Remove coupling nut (1) from back of shell (4) and slide back along harness, exposing pressure plates (15) and gland (2) and pull jack (5) free of shell (4).
(5)Tag jack electrical connections and remove screws (14), nuts (12) and washers (13) attaching wires to jack. Remove jack (5) from electrical harness.
(6)Install protective covers on jack (5) and exposed wires.

C. Installation

(1)Clean and inspect interphone jack interphone and/or adjacent area.
(2)Remove protective covers from jack (5) and connecting wires and attach wires to jack with screws (14), nuts (12) and washers (13). TORQUE screws to between 1.7 and 2.3 lbf.in. (0.019 - 0.026 m.daN).
(3)Attach jack (5) to insulating plate (6) with nut (8) and lockwashers (7). TORQUE nut to between 110 and 120 lbf.in. (1.23 - 1.34 m.daN).
(4)Slide shell (4) over jack until shell contacts insulating plate (6).




Maintenance Interphone Jack
Figure 401

(5)Enclose pressure plates (15) and gland (2) in coupling nut (1) and install coupling nut (1) on shell (4). TORQUE nut to between 29 and 32 lbf.in. (0.32 - 0.36 m.daN), removing slack from harness inside shell, and avoid twisting wires as coupling nut (1) is tightened.
(6)Install screws (9) attaching retainer (3), shell (4) and insulating plate (6) to access plate (11). TORQUE screws to between 8 and 10 lbf.in. (0.09 - 0.11 m.daN).
(7)Install access plate (11) assembly to inlet cowl with screws (10). TORQUE screws to between 20 and 25 lbf.in. (0.22 - 0.28 m.daN).
(8)Remove safety clips and tag and close circuit breaker 20RJ.

D. Test
Carry out operational test of cabin and service interphone (Ref. 23-44-00, P. Block 501), particularly where interphone jack is concerned.

E. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

1. General

The audio integrating system integrates the possibilities of selection for reception and transmission of all the radio communication and radio navigation systems installed on the aircraft.

In transmit mode : the audio integrating system collects and directs the various station microphone inputs to the communication systems.

In receive mode : the audio integrating system collects and directs the communication system and navigation receiver audio outputs to the various stations.

This system provides a means of using :

- the following communication systems :
  - . Flight Interphone 23-41-00 (RL)
  - . Cabin and Service Interphone 23-44-00 (RJ)
  - . Passenger Address 23-31-00 (RY)
  - . HF System 23-11-00 (RE)
  - . VHF System 23-12-00 (RC)
  - . Cockpit Voice Recorder 23-71-00 (RK)
- the following navigation receivers :
  - . Marker Beacon 34-33-00 (RF)
  - . VOR1, VOR2 34-55-00 (RS)
  - . ILS1, ILS2 34-36-00 (RT)
  - . DME1, DME2 34-51-00 (SD)
  - . ADF1, ADF2 34-53-00 (RP)

2. Component Location

**ON A/C 101-200,

(Ref. Fig. 001)

R **ON A/C 001-100, 105-200,

(Ref. Fig. 002)

R **ON A/C 101-104,

R Post SB 23-2082 For A/C 101-104,

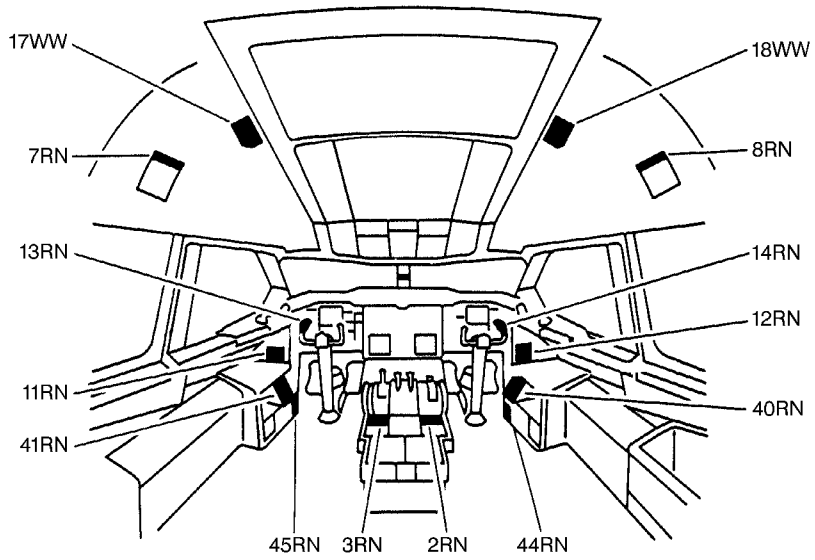
(Ref. Fig. 003)

**ON A/C ALL

(Ref. Fig. 004)

**ON A/C 001-100,

(Ref. Fig. 005)

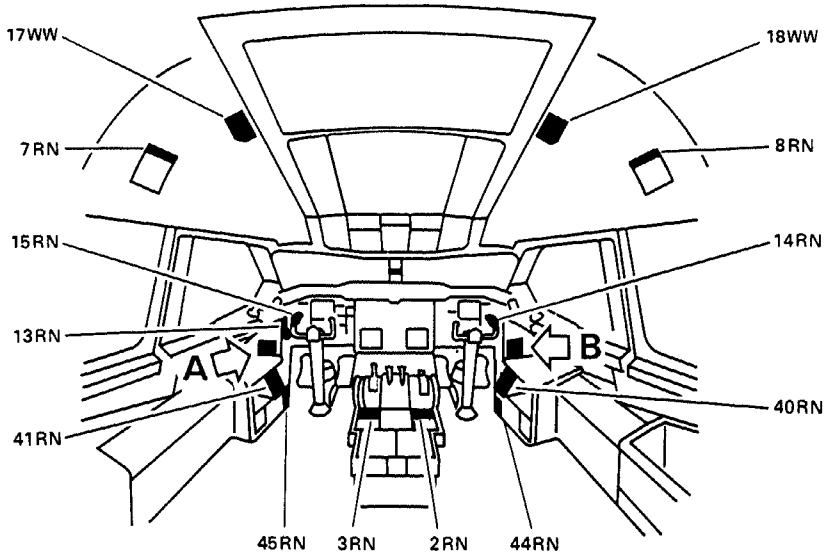


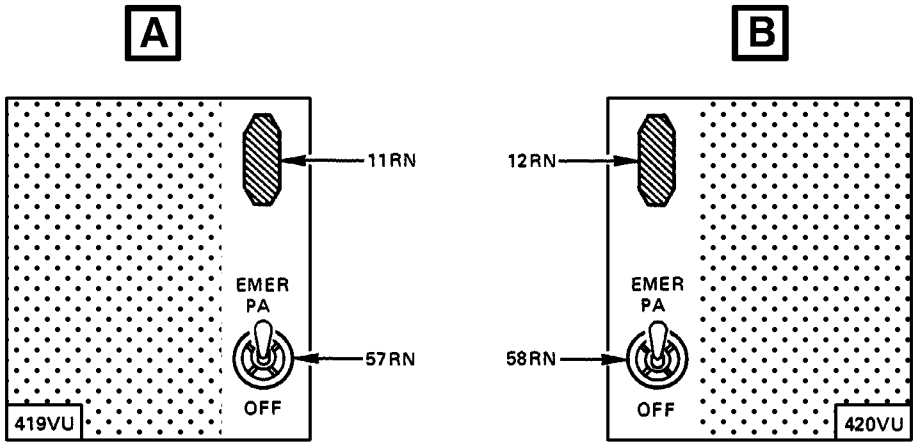

| | | | |
|---|---|---|---|
| 17WW | - LOUDSPEACKER | 18WW | - LOUDSPEACKER |
| 7RN | - JACK PANEL | 8RN | - JACK PANEL |
| 13RN | - INTPH/RAD | 14RN | - INTPH/RAD |
| 11RN | - LOUDSPEACKER POTENTIOMETER | 12RN | - LOUDSPEACKER POTENTIOMETER |
| 41RN | - MASK MICROPHONE | 40RN | - MASK MICROPHONE |
| 45RN | - CONNECTOR | 44RN | - CONNECTOR |
| 3RN | - AUDIO CONTROLE PANEL | 2RN | - AUDIO CONTROLE PANEL |

BM5 23 50 00 0 KEA0 01

Audio Integrating - Component Location in Captain and F/O Stations
Figure 001

R




**A**

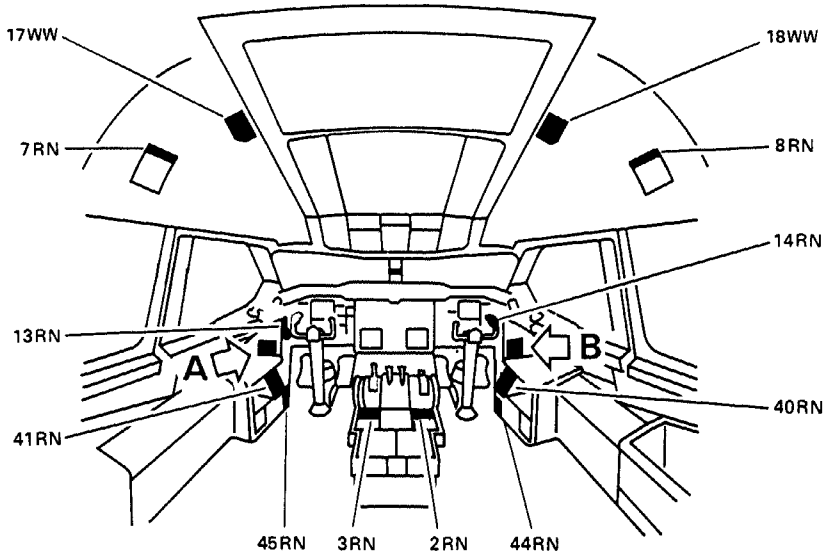
| | |
|---|---|
| 17WW | - LOUDSPEACKER |
| 7RN | - JACK PANEL |
| 15RN | - HAND MICROPHONE |
| 13RN | - INTPH/RAD |
| 11RN | - LOUDSPEACKER POTENTIOMETER |
| 57RN | - EMER/PA SWITCH |
| 41RN | - MASK MICROPHONE |
| 45RN | - CONNECTOR |
| 3RN | - AUDIO CONTROLE PANEL |

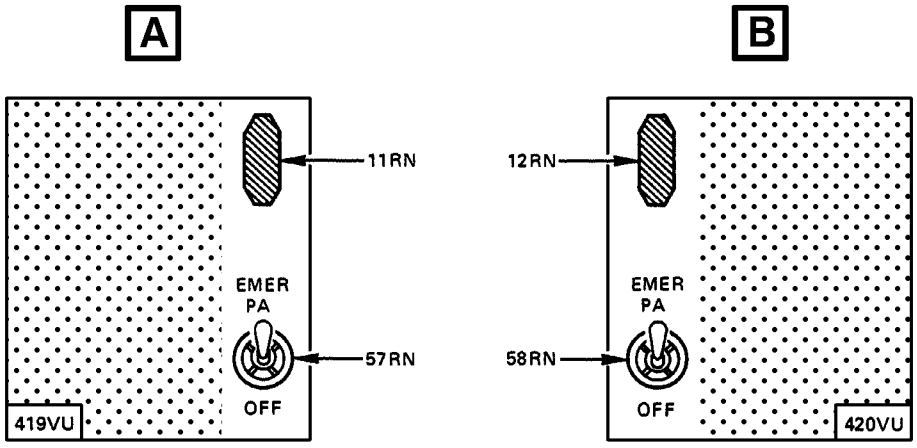
**B**

| | |
|---|---|
| 18WW | - LOUDSPEACKER |
| 8RN | - JACK PANEL |
| 14RN | - INTPH/RAD |
| 12RN | - LOUDSPEACKER POTENTIOMETER |
| 58RN | - EMER/PA SWITCH |
| 40RN | - MASK MICROPHONE |
| 44RN | - CONNECTOR |
| 2RN | - AUDIO CONTROLE PANEL |

BM5 23 50 00 0 KER0 01

Audio Integrating - Component Location in
Captain and F/O Stations
Figure 002




BM5 23 50 00 0 KEC0 00

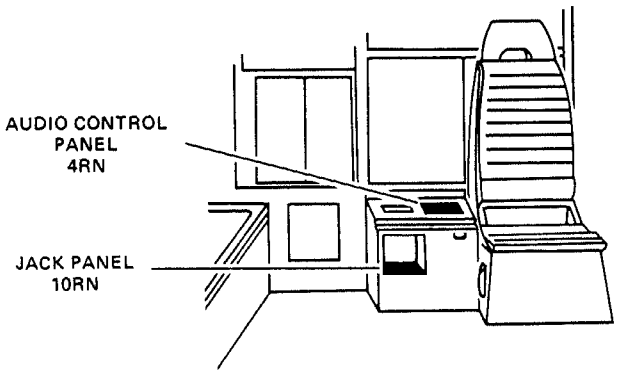
**A**

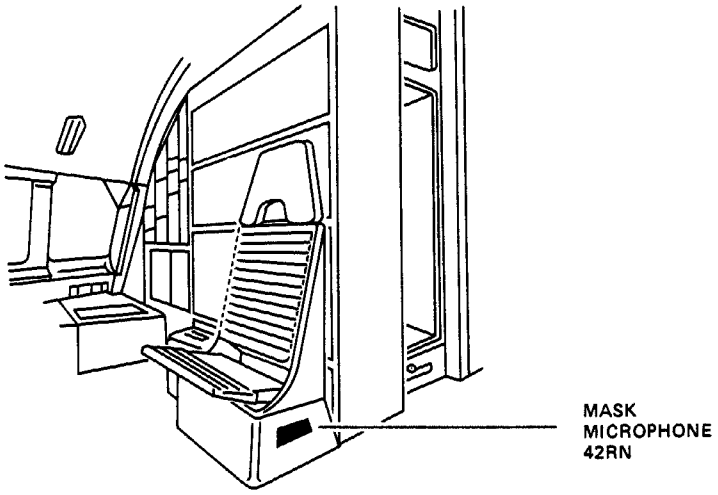
| | |
|---|---|
| 17WW | - LOUDSPEAKER |
| 7RN | - JACK PANEL |
| 13RN | - INTPH/RAD |
| 11RN | - LOUDSPEAKER POTENTIOMETER |
| 57RN | - EMER/PA SWITCH |
| 41RN | - MASK MICROPHONE |
| 45RN | - CONNECTOR |
| 3RN | - AUDIO CONTROL PANEL |

**B**

| | |
|---|---|
| 18WW | - LOUDSPEAKER |
| 8RN | - JACK PANEL |
| 14RN | - INTPH/RAD |
| 12RN | - LOUDSPEAKER POTENTIOMETER |
| 58RN | - EMER/PA SWITCH |
| 40RN | - MASK MICROPHONE |
| 44RN | - CONNECTOR |
| 2RN | - AUDIO CONTROL PANEL |

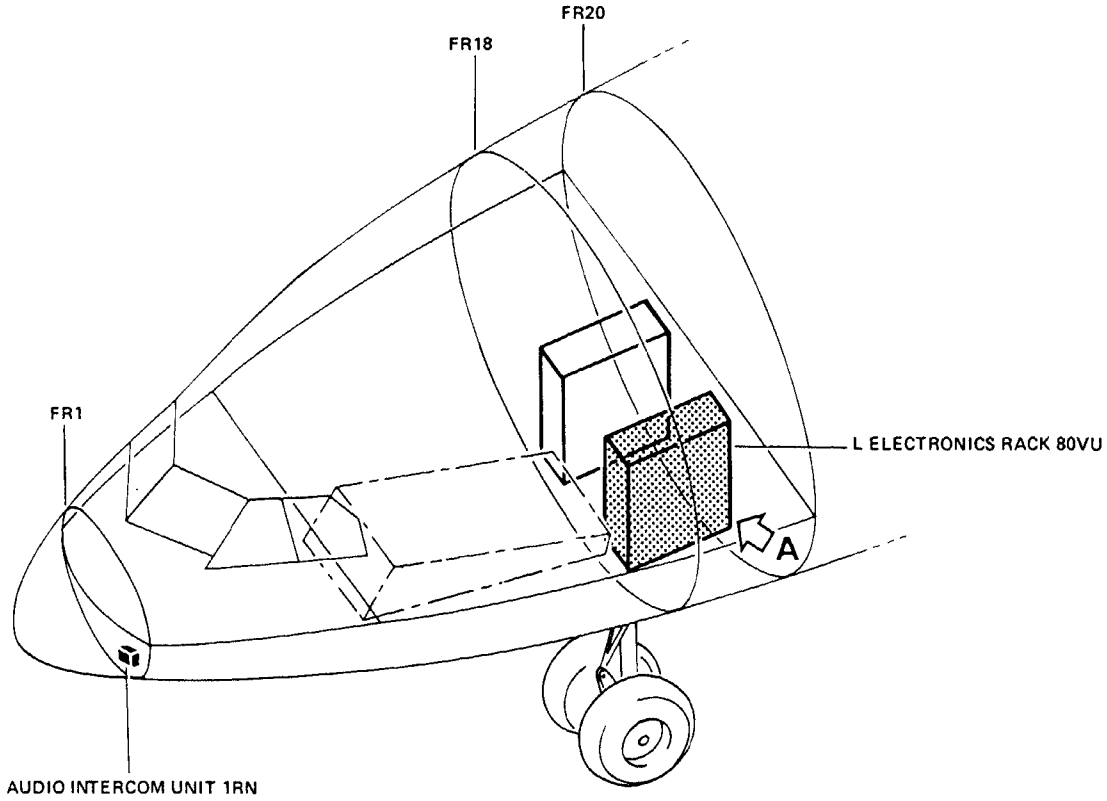
Audio Integrating - Component Location in Captain and F/O Stations
Figure 003

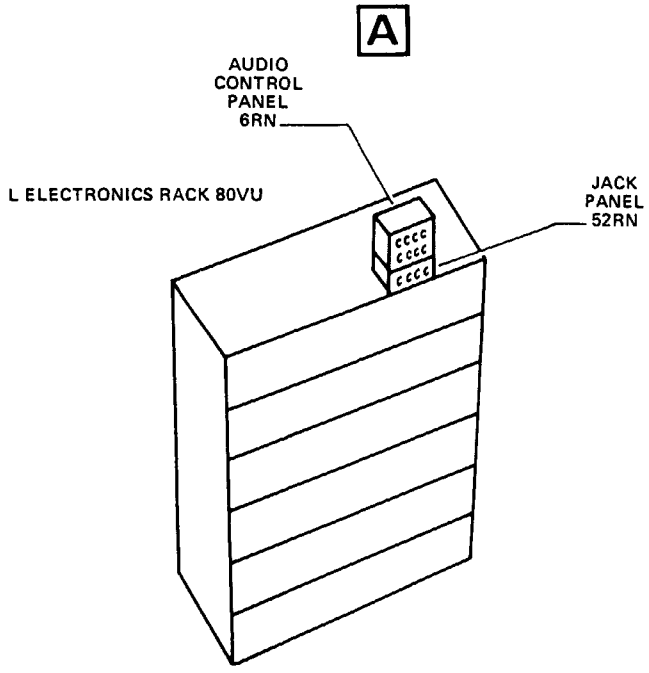



BM5 23 50 00 0 KEB0.00

Audio Integrating - Component Location in
Third Occupant Station
Figure 004




BM5 23 50 00 0 CZM2 12 07
DM5

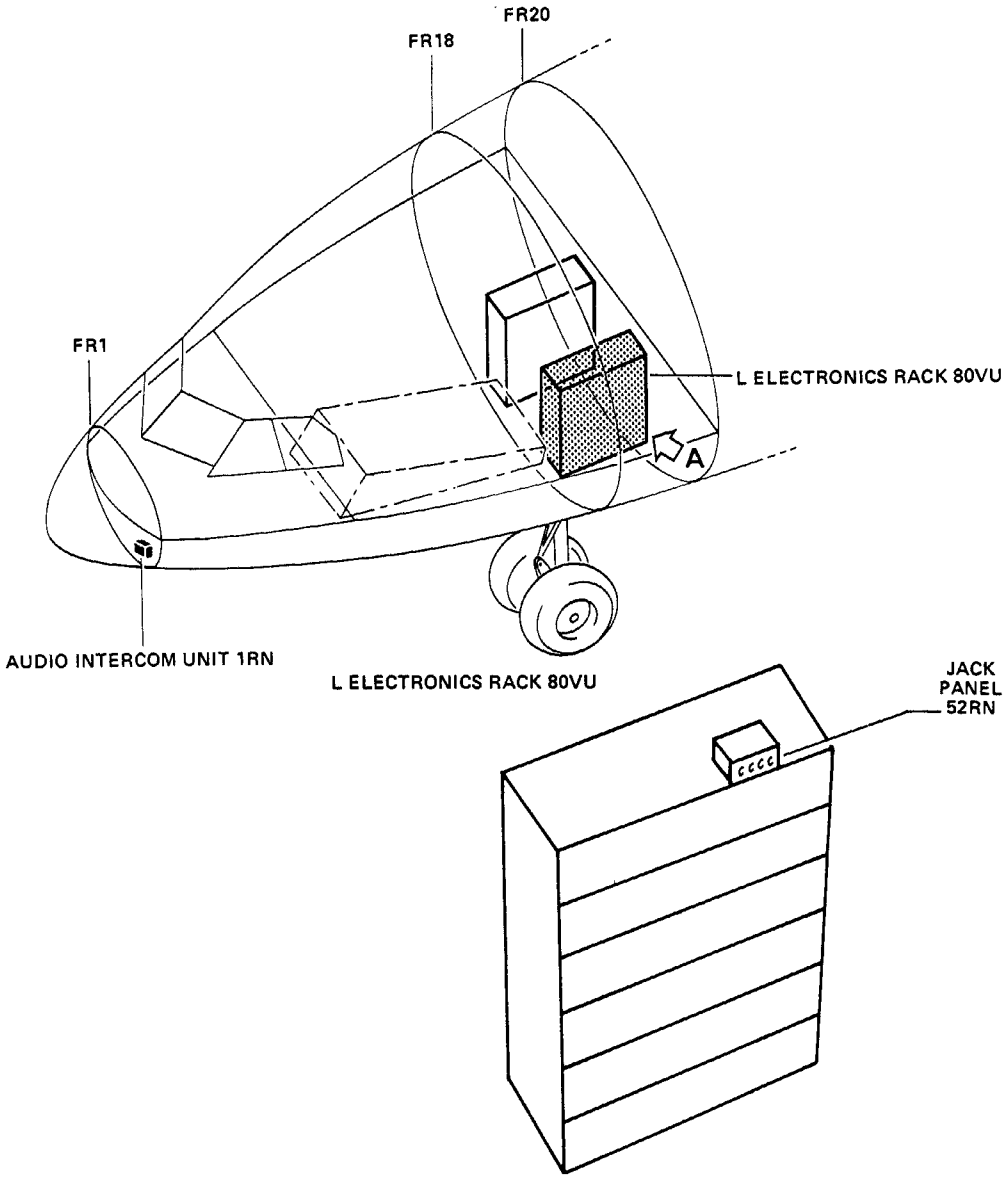
Audio Integrating - Component Location in Avionics Compartment
Figure 005

**ON A/C 101-200,

(Ref. Fig. 006)

**ON A/C ALL

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 1RN | AUDIO INTERCOM UNIT | | 121 | 121BL | 23-51-18 |
| 2RN | AUDIO CTL PNL-F/O | 11VU | 210 | | 23-51-12 |
| 3RN | AUDIO CTL PNL-CAPT | 11VU | 210 | | 23-51-12 |
| 4RN | AUDIO CTL PNL-THIRD OCCUPANT | 300VU | 212 | | 23-51-12 |
| **ON A/C 001-100, | | | | | |
| 6RN | AUDIO CTL PNL-AVIONICS COMPT | | 121 | 121BL | 23-51-12 |
| **ON A/C ALL | | | | | |
| 7RN | JACK PNL-CAPT | | 211 | | 23-51-31 |
| 8RN | JACK PNL-F/O | | 212 | | 23-51-31 |
| 10RN | JACK PNL - THIRD OCCUPANT | 300VU | 212 | | 23-51-31 |
| 11RN | POT-LOUDSPEAKER, CAPT | 419VU | 211 | | |
| 12RN | POT-LOUDSPEAKER, F/O | 420VU | 212 | | |
| 13RN | SWITCH-INTPH/RAD, CAPT | 12VU | 211 | | |
| 14RN | SWITCH-INTPH/RAD, F/O | 14VU | 212 | | |
| 40RN | MASK MICROPHONE-F/O | 7VU | 212 | | |
| 41RN | MASK MICROPHONE-CAPT | 1VU | 211 | | |
| 42RN | MASK MICROPHONE-THIRD OCCUPANT | 300VU | 212 | | |
| 44RN | CONNECTOR-HAND MIC, F/O | 288VU | 212 | | |
| 45RN | CONNECTOR-HAND MIC, CAPT | 287VU | 211 | | |
| 52RN | JACK PNL-AVIONICS COMPT | | 121 | 121BL | 23-51-31 |
| **ON A/C ALL | | | | | |
| R Post SB 23-2082 For A/C 101-104, | | | | | |
| 57RN | SWITCH-EMER PA, CAPT | 419VU | 211 | | |
| 58RN | SWITCH-EMER PA, F/O | 420VU | 212 | | |
| **ON A/C ALL | | | | | |
| 17WW | LOUDSPEAKER-CAPT | | 211 | | |
| 18WW | LOUDSPEAKER-F/O | | 212 | | |

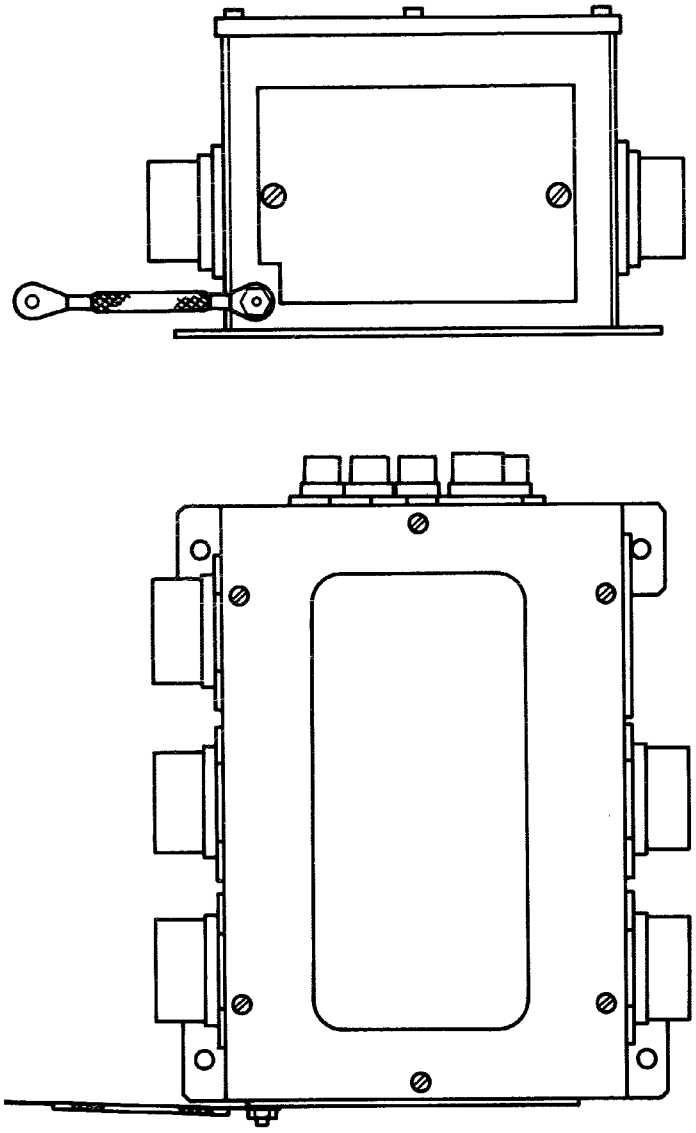



BM5 23 50 00 0 FBA0 00

Audio Integrating - Component Location (Supplementary Occupant Station and Avionics Compartment)
Figure 006

3. System Description

A. Audio Intercommunication Unit
(Ref. Fig. 007)
The audio intercommunication unit is a light-alloy rectangular case. It weighs 1.4 kg.
Interconnection between the different connectors is provided by flexible printed circuit boards. This unit also contains two amplifiers, one for the Flight Interphone function (23-41-00) and the other one for the Cabin and Service Interphone function (23-44-00).



BM5 23 50 00 0 DGM2

Audio Integrating - Audio Intercommunication Unit
Figure 007

B. Audio Control Panel
(Ref. Fig. 008)

(1)Function

The audio control panel provides a means of :

- selecting in transmit mode one radio communication system (HF or VHF) and one interphone system.
- selecting in receive mode
  . the same systems as in transmit mode
  . navigation receivers, (VOR, MARKER, ILS, or ADF), plus passenger address reception
- using a filter for some navigation signals
- performing either direct telephone transmissions or radio transmissions.

(2)Face

The face features :

- square keys for selection of the transmission channels.
  Selection of a channel is obtained by pressing the corresponding key. The light in the key then comes on.
  A mechanical locking device prohibits simultaneous engagement of several keys.
- pushbutton switches with associated potentiometers for selecting the reception channels and adjusting their audio level.
  Selection of a channel is obtained by releasing the pushbutton switch. The light in the pushbutton switch then comes on. The audio level is adjusted by rotating the potentiometer.
  Several reception channels can be selected simultaneously.
- an **INTER/RADIO** switch for controlling the radio and interphone functions. It is a three-position switch :
  - steady : **INTER** and intermediate positions
  - unsteady : **RADIO** position.

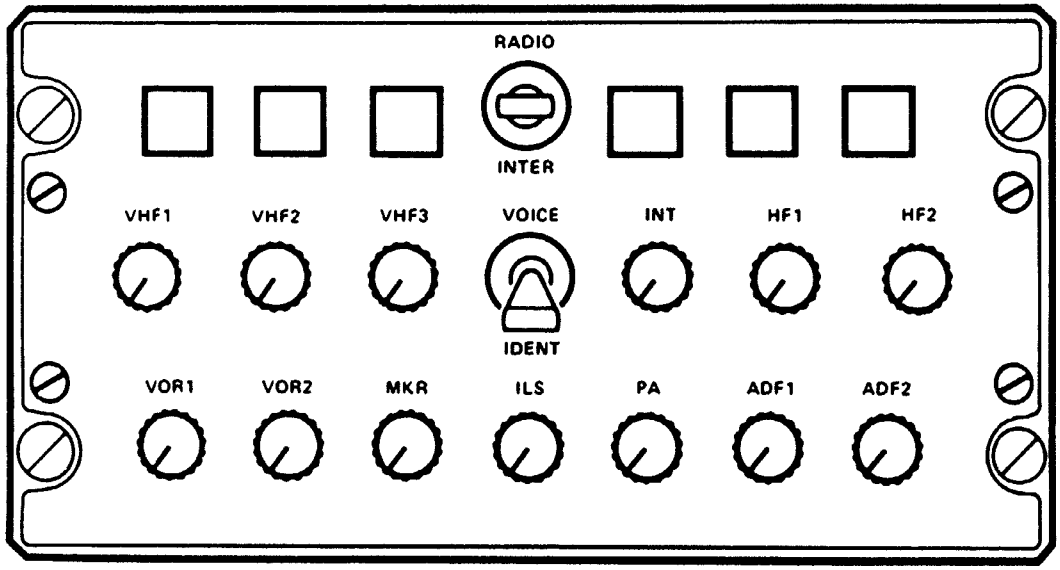
**NOTE** : The Captain and First Officer **INTER/RADIO** switches operate in parallel with the **INTPH/RAD** switches on the control wheels.

- a **VOICE/IDENT** switch which connects a band filter to the **ADF** and **VOR** navigation system audio outputs.

In **VOICE** position, this filter attenuates the signal identifying the selected station.

(3)Back

The back is equipped with two connectors, one for audio intercommunication unit connection and the second for jack panels, mask microphones and additional jacks connections.




BM5 23 50 00 0 ATM3 13 08
DM5

Audio Integrating - Audio Control Panel
Figure 008

C. Jack Panel

(1)Face

(Ref. Fig. 009)

The face features :

- a **BOOM** receptacle for connecting a boomset (low-level)
- a hand microphone connector on the right side
- a headset jack at the middle
- an integral lighting.

(2)Back

The back is equipped with a connector which links the jack panel to the corresponding audio control panel.

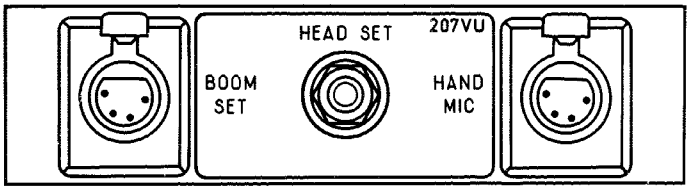
(3)Function

The jack panel allows connection of :

- a hand microphone
- a headset
- a boomset.

The signals received from the audio control panel are fed directly to the headset and the boomset, through the back connector of the jack panel.

The microphone signals, transmitted from hand microphone and boomset, are fed directly to the audio control panel through the back connector of the jack panel.




BM5 23 50 00 0 KLM2

Audio Integrating - Jack Panel
Figure 009

**ON A/C 101-200,

D. Not Applicable

**ON A/C 001-100,

D. Jack Panel - Supplementary

**ON A/C ALL

E. Radio Reception Loudspeakers
(1)Operation
The pushbutton switch integral with loudspeaker potentiometer 11RN or 12RN enables communication and navigation audio signals, selected at the CAPT or F/O audio control panel, to be broadcast through the selected loudspeaker.
NOTE : Aural warnings generated by the FWC (flight warning computer) are also broadcast at these loudspeakers.
They are directly fed to amplifiers without passing through the potentiometers integral with the pushbutton switches.
(2)Muting Circuit
A muting circuit is provided to eliminate the acoustic feedback between microphone and loudspeaker during transmission.
When a microphone is used, the muting relay is energized thus ensuring modification of the amplifier bandpass and sensitivity.
NOTE : The muting circuit also operates when boomsets or mask microphones are used.
In this case, the muting control is activated by the interphone/radio switch or by the EMER PA control switch (if fitted).

F. Interphone/Radio Switches
Each one is a two position switch :
- **INTPH** position (Interphone mode) for the Flight Interphone function.
- **RADIO** position (Radio mode) for speaking through boomset or mask microphones.

**ON A/C 101-200,

G. Not Applicable

**ON A/C ALL

R Post SB 23-2082 For A/C 101-104,

G. Emergency Passenger Address Control Switches
Each one is a two-position switch :
- **OFF** position
- **EMER PA** position for connecting the audio integrating system to the Passenger Address System.

**ON A/C ALL

H. Not Applicable

**ON A/C 101-200,

I. Miscellaneous Acoustic Equipments
The miscellaneous acoustic items of equipment are :
- boomsets which can be connected on the jack panels.
- hand microphones which can be connected on the jacks panels or on independent connectors, located at the Captain and F/O stations.

**ON A/C 001-100,

I. Miscellaneous Acoustic Equipment
The miscellaneous acoustic equipment are :
- boomsets which can be connected on the Captain, First Officer and Third Occupant jack panels
- hand microphones which can be connected on the Captain, First Officer and Third Occupant jack panels or on independent connectors, located on the Captain and First Officer Stations

**ON A/C ALL

- headsets which can be connected on the jack panels (capt, first officer, third occupant and supplementary jack panels) or to an independent jack located at the 5th occupant station (5th occupant headset and jack are optional).
- oxygen mask microphones which are connected to the corresponding audio control panel.

In addition the system uses two loudspeakers which are part of the ECAM system 31-12-00 (WW) and two selector switches which are part of the EFIS circuits 34-70 (FN).

4. Electrical Power Supply

**ON A/C 101-200,

(Ref. Fig. 010)

**ON A/C 001-100,

(Ref. Fig. 011)

**ON A/C 101-200,

(Ref. Fig. 012)

**ON A/C 001-100,

(Ref. Fig. 013)

**ON A/C ALL

The audio integrating system is supplied with 28VDC from ultimate emergency busbar 3PP by two sub-busbars 303 and 306PP.

A. Busbar 303PP
. Captain audio control panel via 3A circuit breaker 30RN
. Third Occupant audio control panel via 3A circuit breaker 32RN.

B. Busbar 306PP
. First Officer audio control panel via 3A circuit breaker 31RN

**ON A/C 101-200,

Circuit breakers 30RN, 31RN and 32RN are located on circuit breaker panel 22VU (line 205).

**ON A/C 001-100,

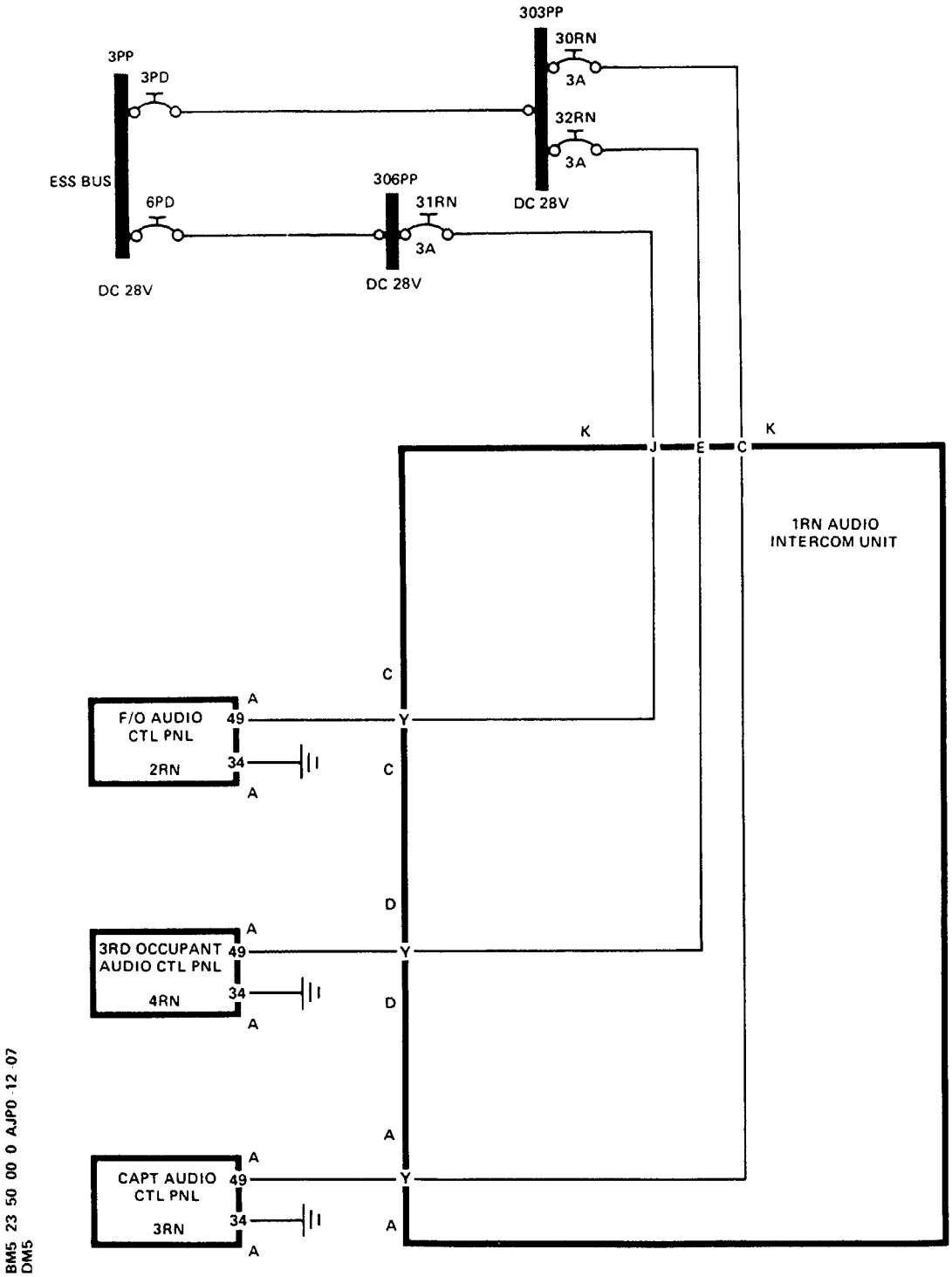
. Avionics audio control panel via 3A circuit breaker 33RN
Circuit breakers 30RN, 31RN, 32RN and 33RN are located on circuit breaker panel 22VU (line 205).

**ON A/C ALL

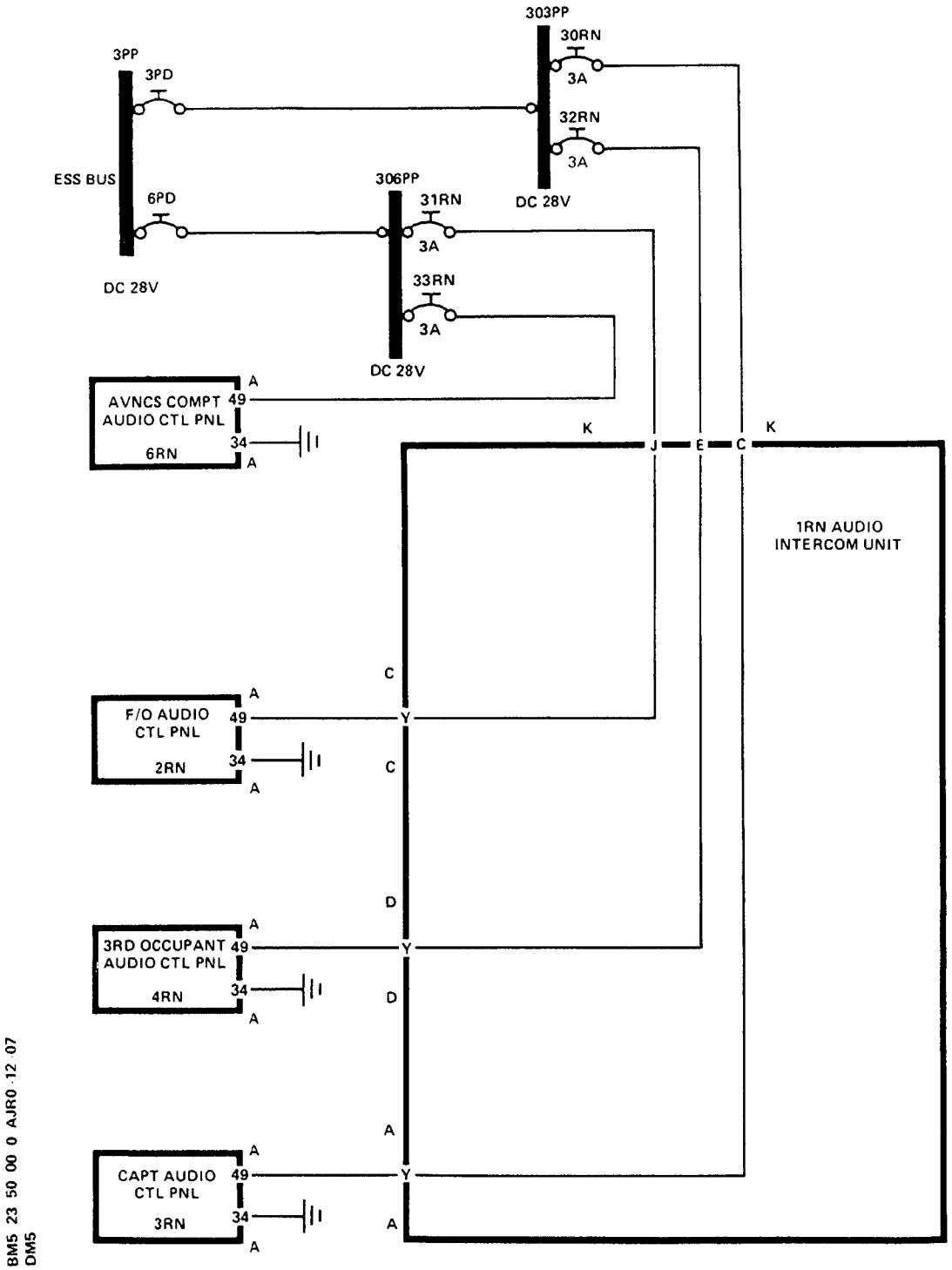
5. Operation

**ON A/C 101-200,

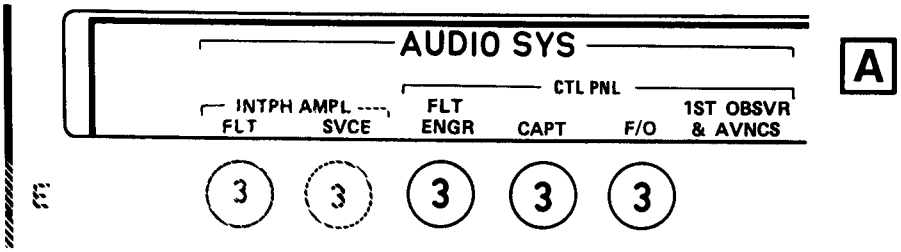
(Ref. Fig. 014)

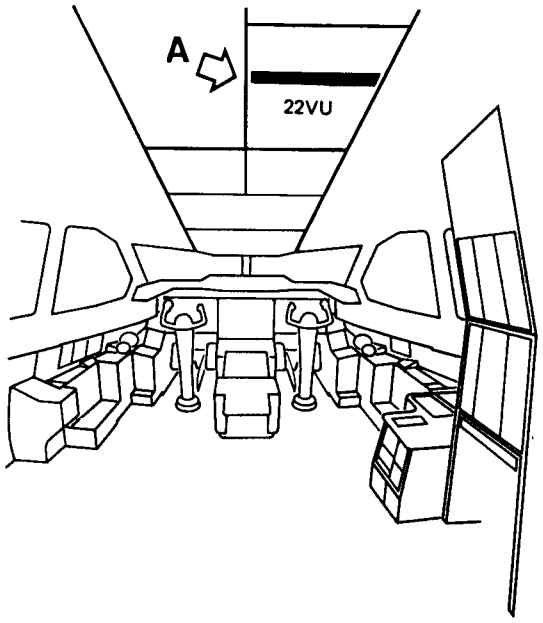



Audio Integrating - Electrical Power Supply - Schematic
Figure 010



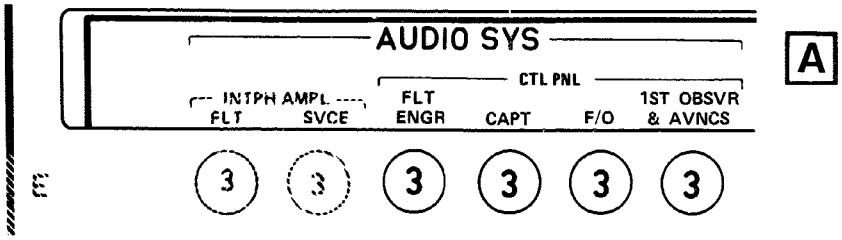

Audio Integrating - Electrical Power Supply - Schematic
Figure 011

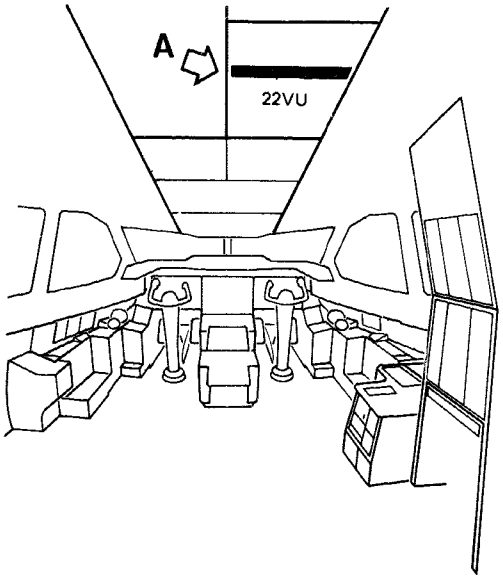



BM5 23 50 00 0 FBR0 - 00

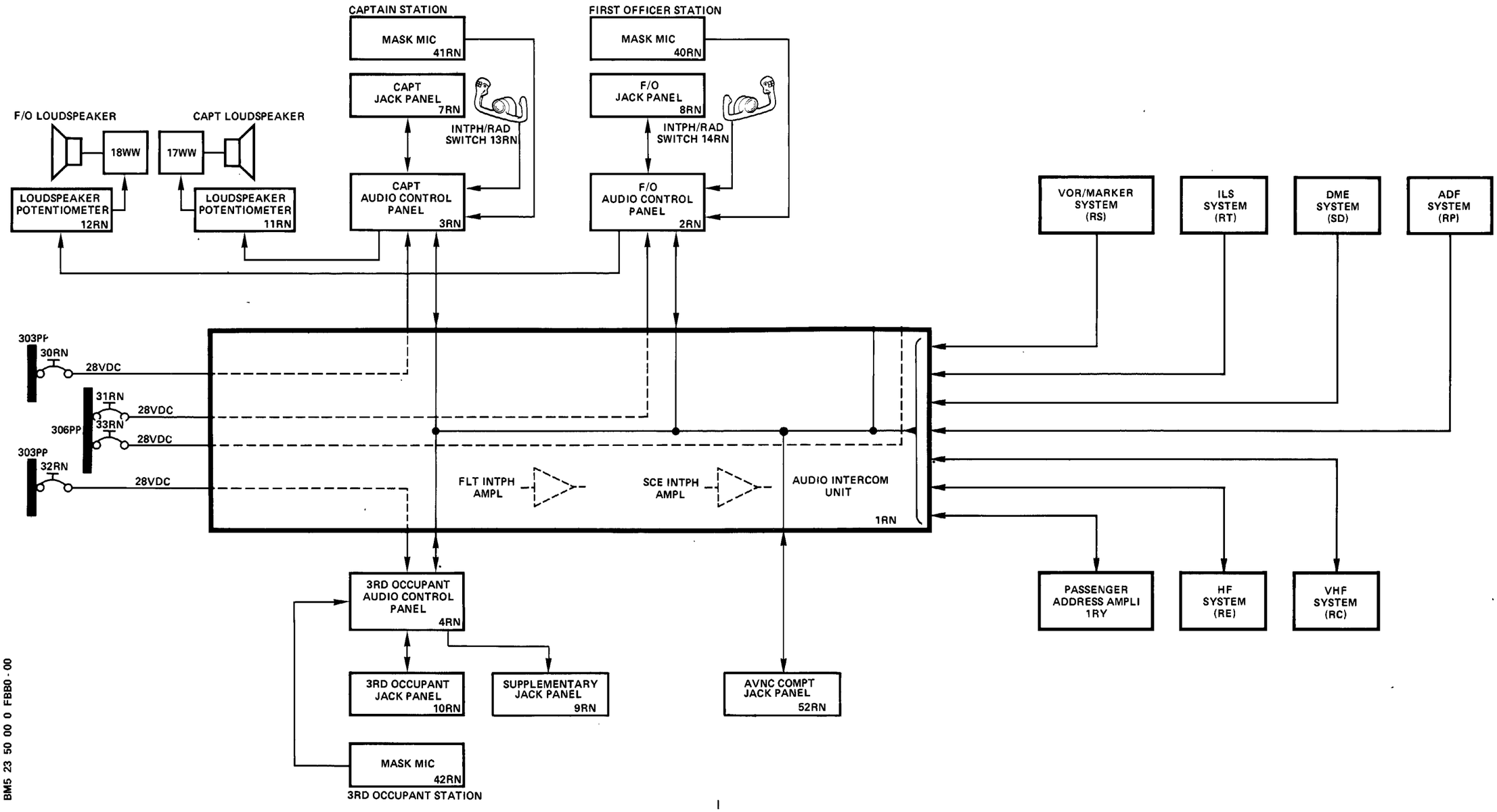
Audio Integrating - Circuit Breaker Location
Figure 012




BM5 23 50 00 0 JGM2

Audio Integrating - Circuit Breaker Location
Figure 013




BM5 23 50 00 0 FBB0 00

Audio Integrating - Block Diagram
Figure 014

**ON A/C 001-100,

(Ref. Fig. 015)

**ON A/C ALL

The possibilities of selection for reception and transmission of the various radio communication components and for reception of the various radio navigation components are provided by different acoustic equipment (boomset, headset, loudspeaker, hand microphone, mask microphone) and by control devices (Push To Talk switches).
For each station (Captain, First Officer, etc.) these components are connected to one or several radio navigation and radio communication items of equipment through audio control panels and through audio intercommunication unit.

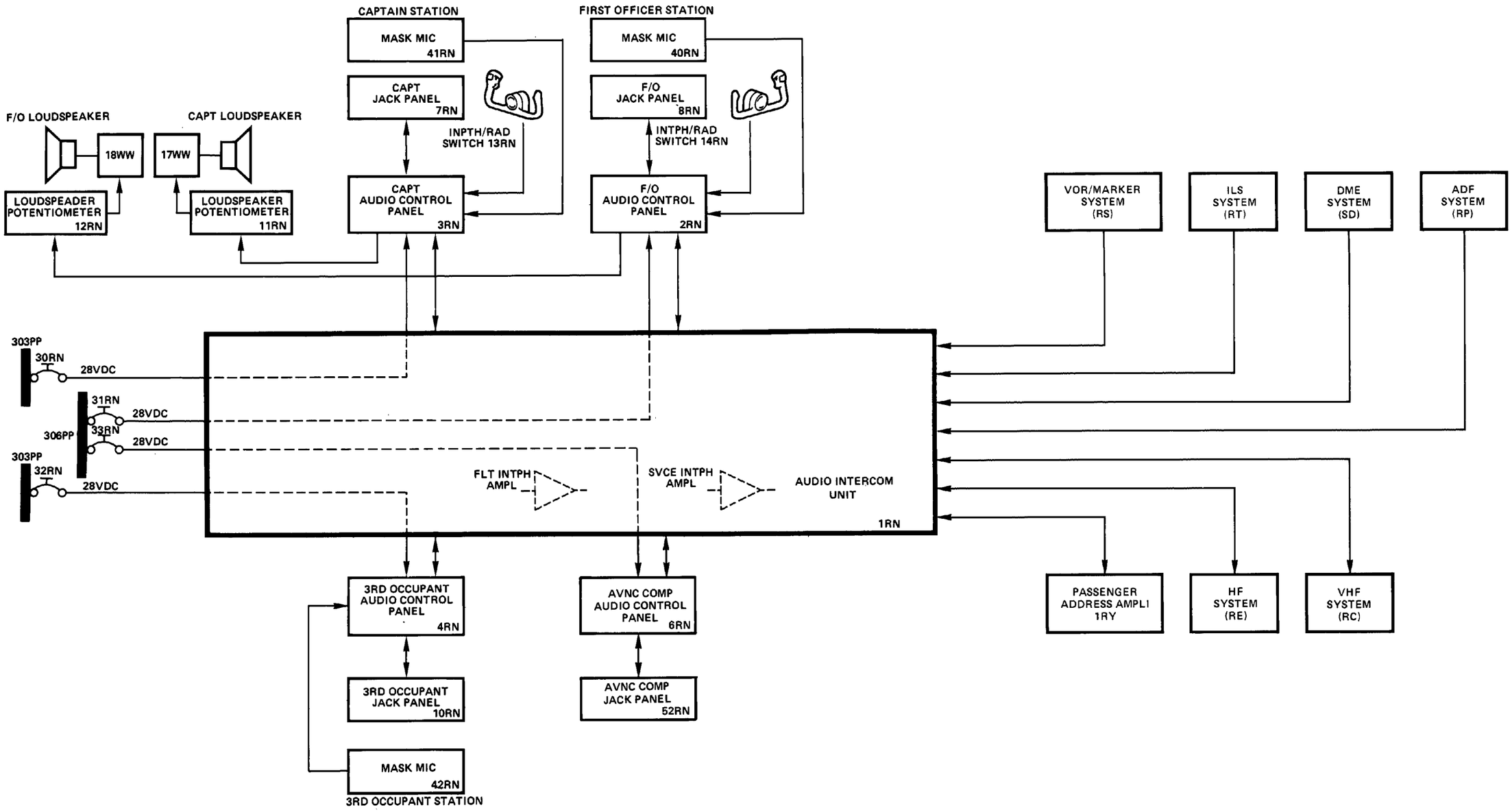
A. Flight Interphone Amplifier Operation
Several possibilities are offered for speaking from the flight compartment.
(1)Using the hand microphone, the **INT** square key on the audio control panel must be engaged. Pressing the **PTT** switch of the hand microphone, the system is keyed.
(2)Using boomset or mask microphone, there are two operation modes.
(a)Radio mode :
The **INT** square key must be engaged, then, the system is keyed using either the **INTER/RADIO** switch on the audio control panel or the **INTPH/RAD** switch on the control wheel on Radio position.
(b)Direct interphone mode :
You speak directly through the Flight Interphone amplifier by placing the **INT/RADIO** switch on the audio control panel or the **INTPH/RAD** switch on the control wheel to Interphone position, whatever the square key engaged.

B. VHF and HF Radio Communication Operation
The desired system is selected by pressing the corresponding square key on the audio control panel (for example **VHF1**). Note that the selected key comes on.
(1)Using hand microphone : key the system by means of Push To Talk (PTT) switch located on the hand microphone.
(2)Using boomset or mask microphone : key the system by means of the **INTER/RADIO** switch on the audio control panel or the **INTPH/RAD** switch on the control wheel, placed to Radio position.
(3)By releasing **VHF1** reception pushbutton, you can listen to the **VHF1** reception signals. The light in the pushbutton comes on and the audio level is adjusted by rotating the pushbutton.

**ON A/C 101-200,

C. Passenger Address System Operation
(1)Using Interphone/Passenger Address handset (normal function :

INTENTIONALLY BLANK




BM5 23 50 00 D KESU-UU

Audio Integrating - Block Diagram
Figure 015

Ref. 23-31-00).
(2)Using boomset, hand microphone or mask microphone : press PA square key to be directly connected to the PA amplifier through the audio integrating system (emergency function).

R **ON A/C 001-100, 105-200,

C. Passenger Address System Operation
(1)With interphone/passenger address handset (normal function).
(2)With boomset or mask microphone (emergency function).
Place the EMERGENCY PASSENGER ADDRESS control switches to EMER PA position to be directly connected to the PA amplifier through the audio integrating system.

R **ON A/C 101-104,

R Post SB 23-2082 For A/C 101-104,

C. Passenger Address System Operation
(1)Using Interphone/Passenger Address handset (normal function : Ref. 23-31-00).
(2)Using boomset, hand microphone or mask microphone : place the EMER PA control switches to EMER PA position to be directly connected to the amplifier through the audio integrating system.

**ON A/C ALL

D. Navigation Reception Operation
(1)IDENT position
On the audio control panel, when the VOICE/IDENT switch is in IDENT position, the audio outputs of the VOR, ADF and DME systems are, after selection, amplified and directly fed to the acoustic equipment.
(2)VOICE position
When the switch VOICE/IDENT is placed to VOICE position, a filter attenuates the identification signals of the VOR and ADF channels.
(3)Reception of a DME identification signal
When VOR/NAV/ILS mode selector on panels 412VU and 413VU, is in VOR or NAV position DME signals can be heard by releasing the, related VOR pushbutton.
NOTE : If the VOICE/IDENT switch is in VOICE position, reception of the DME signals is not possible.
When the VOR/NAV/ILS mode selector, on panels 412VU and 413VU, is in ILS position, DME signals can be heard by releasing the ILS pushbutton.
NOTE : In this case, reception of the DME stations is possible whatever the VOICE/IDENT switch position.

1. Operational Test

A. Reason for the Job

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | boomset |
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

R WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.

(1)Job set-up
(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)Close overhead panel circuit breakers, particularly those associated with AUDIO SYS, COM and CALLS Systems.

(2)Test

| ACTION | RESULT |
|---|---|
| 1. On audio control panel<br>- place INT Mike selector Button in ON position. | |
| 2. At Captain's station<br>- speak into hand microphone while holding PTT switch on. | Check reception at boomset at other crew member's stations. |
| 3. On each audio control panel<br>- turn counterclockwise potentiometer integral with the INT reception pushbutton. | At each crew member's station, check action of potentiometer on reception level. |
| 4. On audio control panel<br>- place INT Mike Selector Button in OFF position. | |
| 5. On audio control panel<br>- place RADIO/INTER switch in INTER position. | |
| 6. At each crew member's station<br>- check direct interphone communication using mask microphone and headset. | Check quality of reception at each crew member's station. |

| ACTION | RESULT |
|---|---|
| 7. At each crew member's station<br>- check direct interphone communication using boomset. | Check quality of reception at each crew member's station. |
| R 8. At Captain's and First Officer's stations<br>R - check reception through loudspeaker | Check quality of reception. |

(3)Close-up

R (a)Place **RADIO/INTER** switch at selected station in intermediate position.

(b)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(c)Remove all ground handling and maintenance equipment, standard and special tools, together with ground power equipment, all access equipment and miscellaneous items.

2. Functional Test

Identical to Operational Test.

1. Deactivation

A. Reason for the Job
Ref : MMEL Sect. 1-23, Item 6)

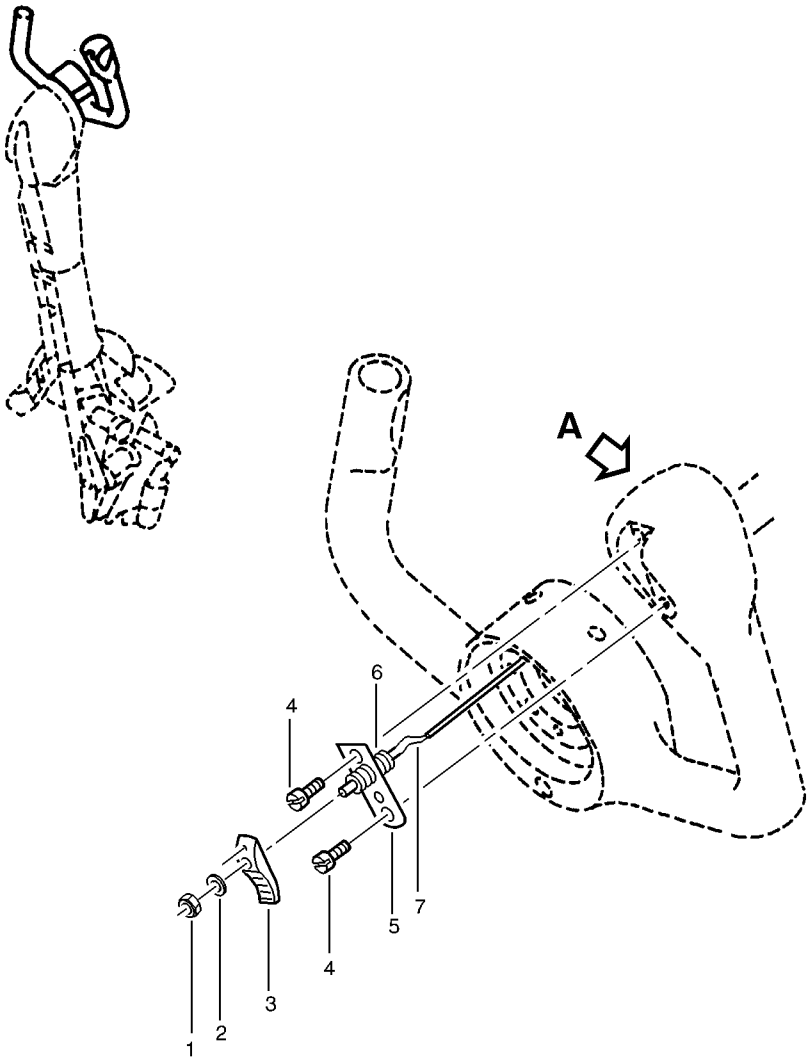
B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Contact Insertion/Extraction Tool |
| C. | Heat-shrink Sleeve |
| D. | Hot Air Generator |
| E. | Cable Tie |
| F. | Adhesive INOP Label |
| Referenced Procedures | |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 23-51-00, P. Block 501 | Audio Integrating |
| - ESPM 20-42-12 | Shrink Sleeve |
| - ESPM 20-25-31 | Hot Air Generator |

C. Procedure
(Ref. Fig. 901)
(1)Job set-up
(a)Energize the ground service network (Ref. AMM 24-41-00, P. Block 301).
(b)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/CTL PNL/CAPT | 30RN | 20VU210 |
| 22VU | AUDIO SYS/CTL PNL/F/O | 31RN | 20VU210 |

(2)Deactivation
(a)Remove sealant in counterbore.
(b)Remove nut (1) and washer (2).
(c)Remove trigger (3).
(d)Remove screws (4) and extract plate (5) with switch reverser (6) from control wheel.
(e)Cut power supply wires (7).
(f)Stow cables using heat-shrink sleeve NSA937502 (Ref. ESPM 20-42-12) and a hot air generator (Ref. ESPM 20-25-31).
(g)Fasten heat-shrink sleeve/cable assembly on the existing bundle using a cable tie.
NOTE : During this operation, comply with the cable bend radius.
R (h)Install switch reverser (6) and extract plate (5) with screws (4).
R (j)Install trigger (3) with washer (2) and nut (1).
R (k)Affix an adhesive INOP label to the failed control wheel (Captain
R or F/O).
R (l)Remove safety clips and tags and close circuit breakers.




BM5 23 51 00 9 CEA0 00

INTPH/RAD Switch
Figure 901

R

D. Test

(1)Perform the operational test of the audio integrating system (Ref. AMM 23-51-00, P. Block 501).

E. Close-up

(1)De-energize the ground service network (Ref. 24-41-00, P. Block 301).

(2)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

2. Reactivation

A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Contact Insertion/Extraction Tool |
| C. | Cable Tie |
| Referenced Procedures | |
| - 24-41-00, P. Block 301 | AC External Power Control |

B. Procedure

(1)Job set-up

(a)Energize the ground service network (Ref. 24-41-00, P. Block 301).

(b)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/CTL PNL/CAPT | 30RN | 20VU210 |
| 22VU | AUDIO SYS/CTL PNL/F/O | 31RN | 20VU210 |

(2)Reactivation

R (a)Remove nut (1) and washer (2).

R (b)Remove trigger (3).

R (c)Remove screws (4) and extract plate (5) with switch reverser (6) from control wheel.

R (d)Cut cable tie on heat-shrink sleeve/cable assembly.

R (e)Remove heat-shrink sleeve.

R NOTE : Never use a scalpel, you may damage the cable protection sleeve.

R (f)Connect cables to switch reverser (6).

R (g)Install switch reverser (6) and extract plate (5) with screws (4).

R (h)Install trigger (3) with washer (2) and nut (1).

C. Test

| ACTION | RESULT |
|---|---|
| 1. On Captain's (First Officer's) control wheel, place INTPH/RAD switch in INT position. | |

| ACTION | RESULT |
|---|---|
| 2. On Captain's (First Officer's) audio control panel, select interphone function. | |
| 3. Speak into Captain's (First Officer's) boomset microphone | Check that voice is received at First Officer's (Captain's) headset. |
| 4. On Captain's (First Officer's) control wheel, place **INTPH/RAD** switch in **RAD** position. | |
| 5. Speak into Captain's (First Officer's) boomset microphone | Check that voice is received at First Officer's (Captain's) headset. |

D. Close-up
(1)De-energize the ground service network (Ref. AMM 24-41-00, P. Block 301).
(2)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

R **ON A/C 101-200,

## AUDIO CONTROL PANEL (2RN - 3RN - 4RN) - REMOVAL/INSTALLATION

R **ON A/C ALL

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers :
(a)For First Officer audio control panel 2RN

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/CTL PNL/F/O | 31RN | 205/E20 |
| 132VU | LIGHTING/INTEGRAL LT/C/B & OVHD AND PED | 3LF | 322/N77 |

(b)For Captain audio control panel 3RN

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/CTL PNL/CAPT | 30RN | 205/E19 |
| 132VU | LIGHTING/INTEGRAL LT/C/B AND OVHD AND PED | 3LF | 322/N77 |

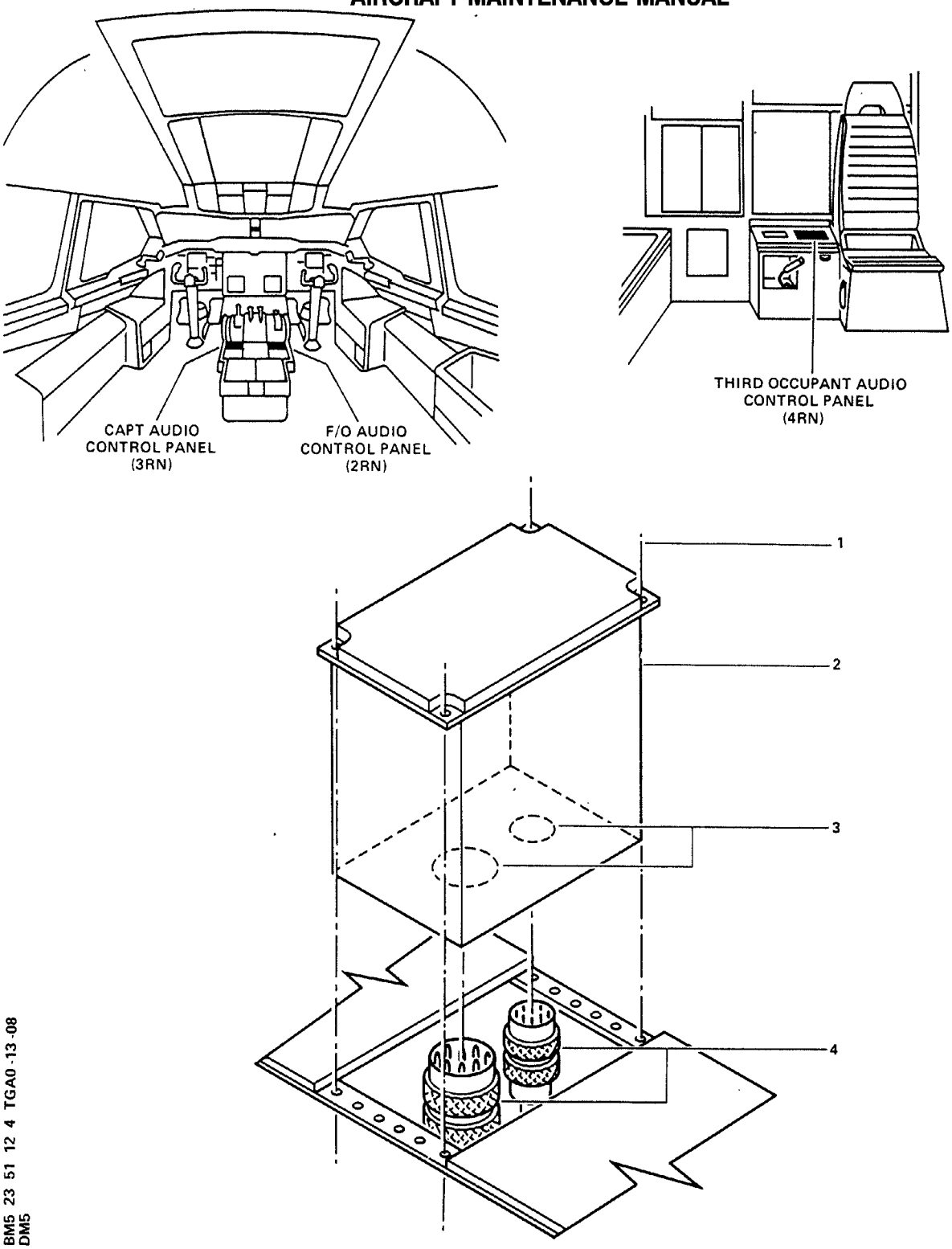
(c)For Third Occupant audio control panel 4RN

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/CTL PNL/THIRD OCCUPANT | 32RN | 205/E18 |
| 132VU | LIGHTING/INTEGRAL LT/C/B AND OVHD AND PED | 3LF | 322/N77 |

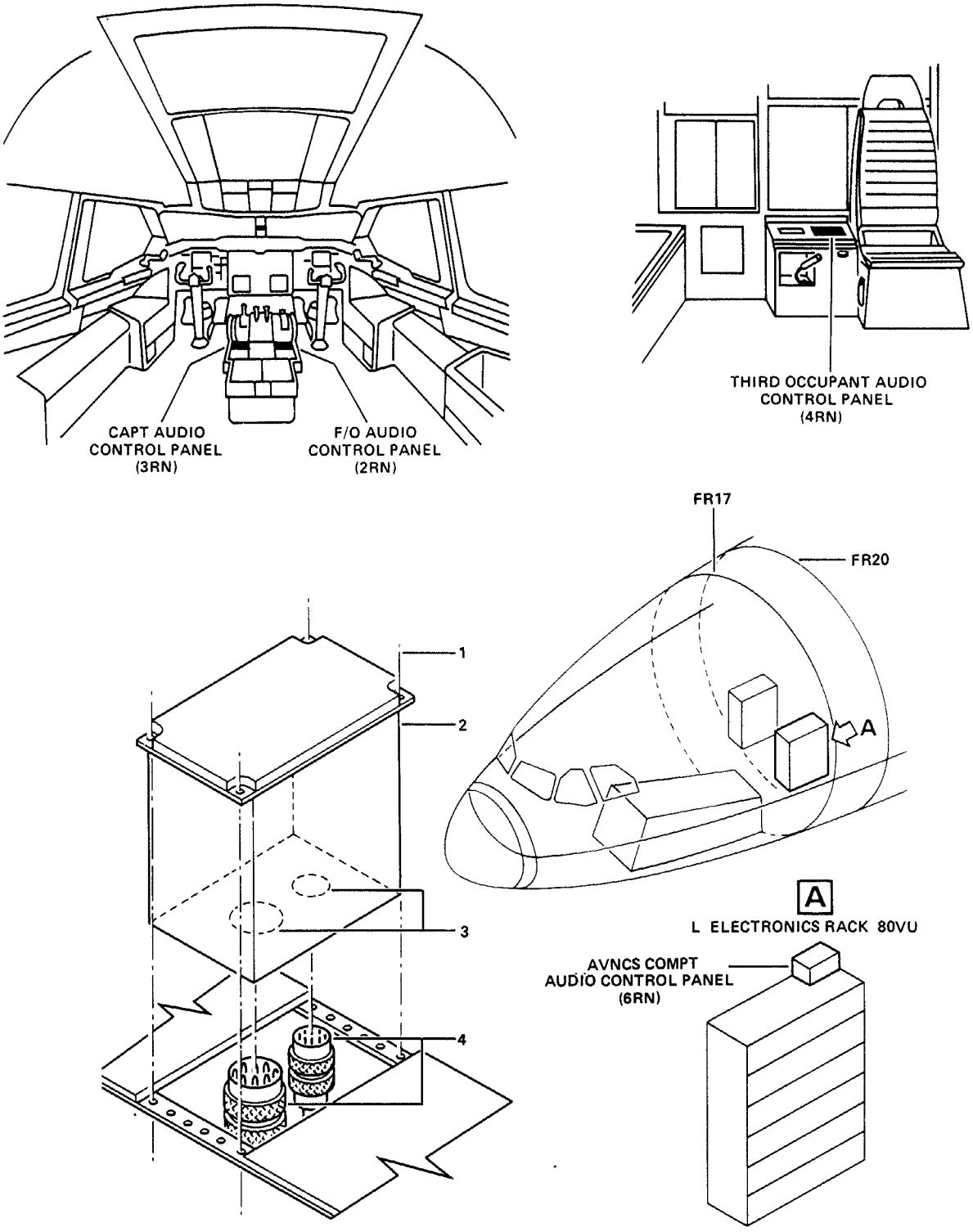
R **ON A/C 001-100,

(d)For avionics compartment audio control panel 6RN

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/CTL PNL/FOURTH OCCUPANT & AVNCS | 33RN | 205/E21 |




Audio Control Panel
Figure 401




BM5 23 51 12 4 AEM2 17

Audio Control Panel
Figure 402

R **ON A/C ALL

B. Removal
(1)Unlock Dzus fasteners (1).
(2)Remove audio control panel (2) from housing.
(3)Disconnect electrical connectors (4).
(4)Cap electrical connectors (3) and (4).
NOTE : For the 3rd Occupant audio control panel (4RN) only, plugs 4RNA and 4RNB are connected or disconnected via an access panel at the back of panel 300VU.

C. Installation
(1)Clean and inspect audio control panel (2) interface and adjacent area.
(2)Remove blanking caps from electrical connectors (3) and (4). Check for correct condition of connectors.
(3)Position audio control panel (2) and connect electrical connectors (4).
(4)Install audio control panel (2) and lock Dzus fasteners (1).
(5)Remove safety clips and tags and close the following circuit breakers :
(a)For First Officer audio control panel 2RN, 31RN and 3LF.
(b)For Captain audio control panel 3RN, 30RN and 3LF.
(c)For Third Occupant audio control panel 4RN, 32RN and 3LF.

R **ON A/C 001-100,

(d)For avionics compartment audio control panel 6RN, 33RN

R **ON A/C ALL

D. Test
Test replacement component by operating flight interphone, checking that reception is normal.

E. Close-Up
Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

## INTPH/RAD SWITCH (13RN, 14RN) - REMOVAL/INSTALLATION

For removal of the **INTPH/RAD** switch (**13RN** and **14RN**), remove the control wheel (Ref. **AMM** 27-11-11, **P.** Block 401 and **CMM** 27-31-12).

## AUDIO INTERCOMMUNICATION UNIT (1RN) - REMOVAL/INSTALLATION

### 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |

### 2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/CTL PNL/THIRD OCCUPANT | 32RN | 205/E18 |
| 22VU | AUDIO SYS/CTL PNL/CAPT | 30RN | 205/E19 |
| 22VU | AUDIO SYS/CTL PNL/F/O | 31RN | 205/E20 |
| 22VU | AUDIO SYS/CTL PNL/FOURTH OCCUPANT & AVNCS | 33RN | 205/E21 |
| 22VU | AUDIO SYS/INTPH AMPL/FLT | 1RL | 205/E16 |
| 22VU | AUDIO SYS/INTPH AMPL/SVCE | 20RJ | 205/E17 |

(2)Open access door 121 BL

B. Removal

(1)Disconnect electrical connectors (1) and (6).
(2)Disconnect bonding lead (4).
(3)Remove screws (2) securing audio intercommnunication unit to structure.
(4)Remove unit (3).
(5)Cap electrical connectors (1), (5), (6) and (7).

C. Installation

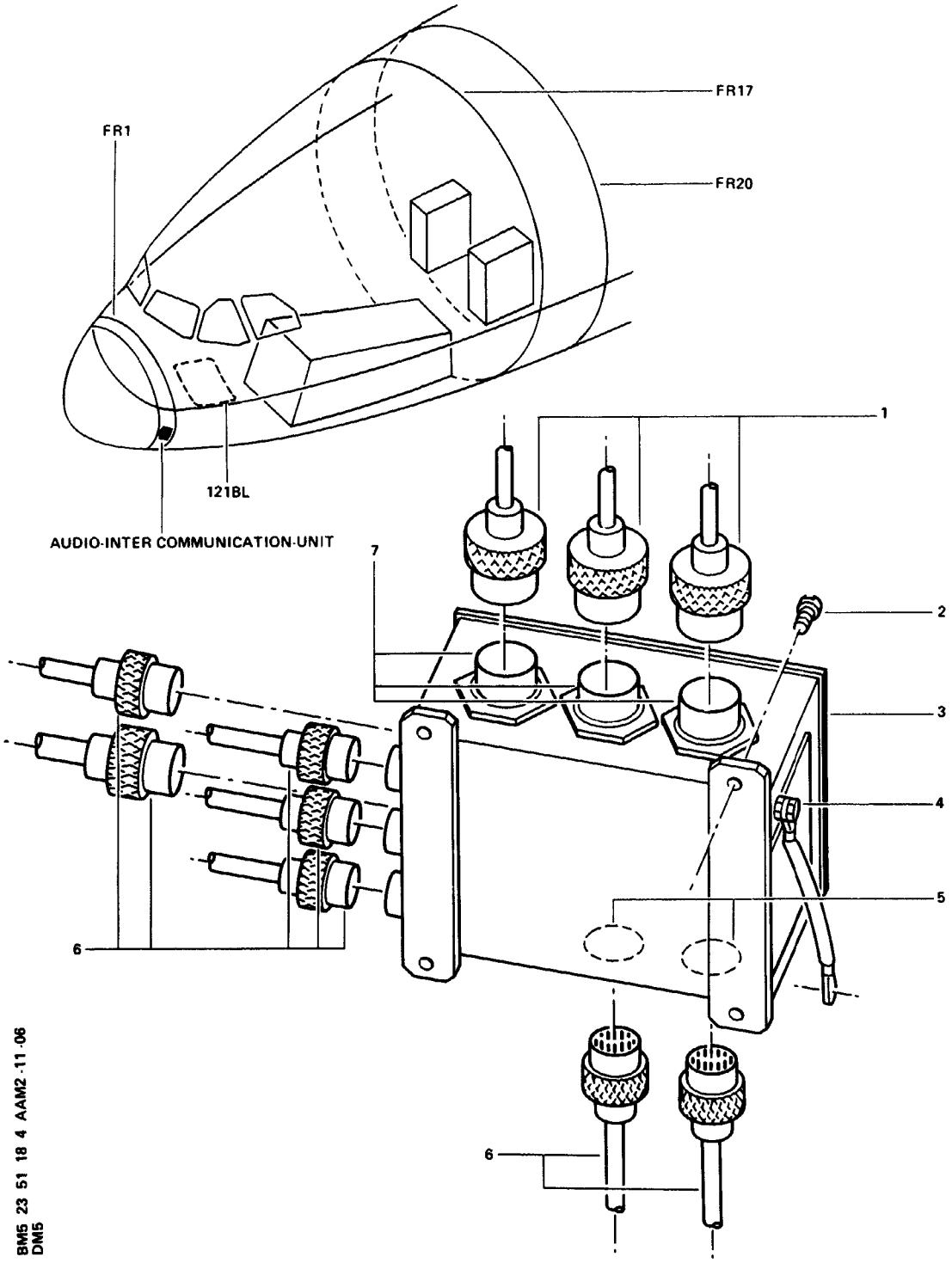
(1)Clean and inspect audio intercommunication unit (3) interface and adjacent area.
(2)Remove blanking caps from connectors (1), (5), (6) and (7).
(3)Secure audio intercommunication unit to structure.
(4)Secure bonding lead (4) to audio communication unit (3).
(5)Connect electrical connectors (1) and (6).
(6)Remove safety clips and tags and close circuit breakers 32RN, 30RN, 31RN, 33RN, 1RL and 20RJ.

D. Tests

R Carry out operational test of cabin and service interphone (Ref. 23-44-00,
R P. Block 501) and audio integrating (Ref. 23-51-00, P. Block 501).

E. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close access door 121 BL.




Audio Intercommunication Unit
Figure 401

R JACK PANEL - REMOVAL/INSTALLATION

R

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |
| Referenced Procedure<br>- 23-41-00, P. Block 501 | Flight Interphone |

**ON A/C 001-100,

(Ref. Fig. 401)

**ON A/C 101-200,

(Ref. Fig. 402)

**ON A/C ALL

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers :
For 7RN

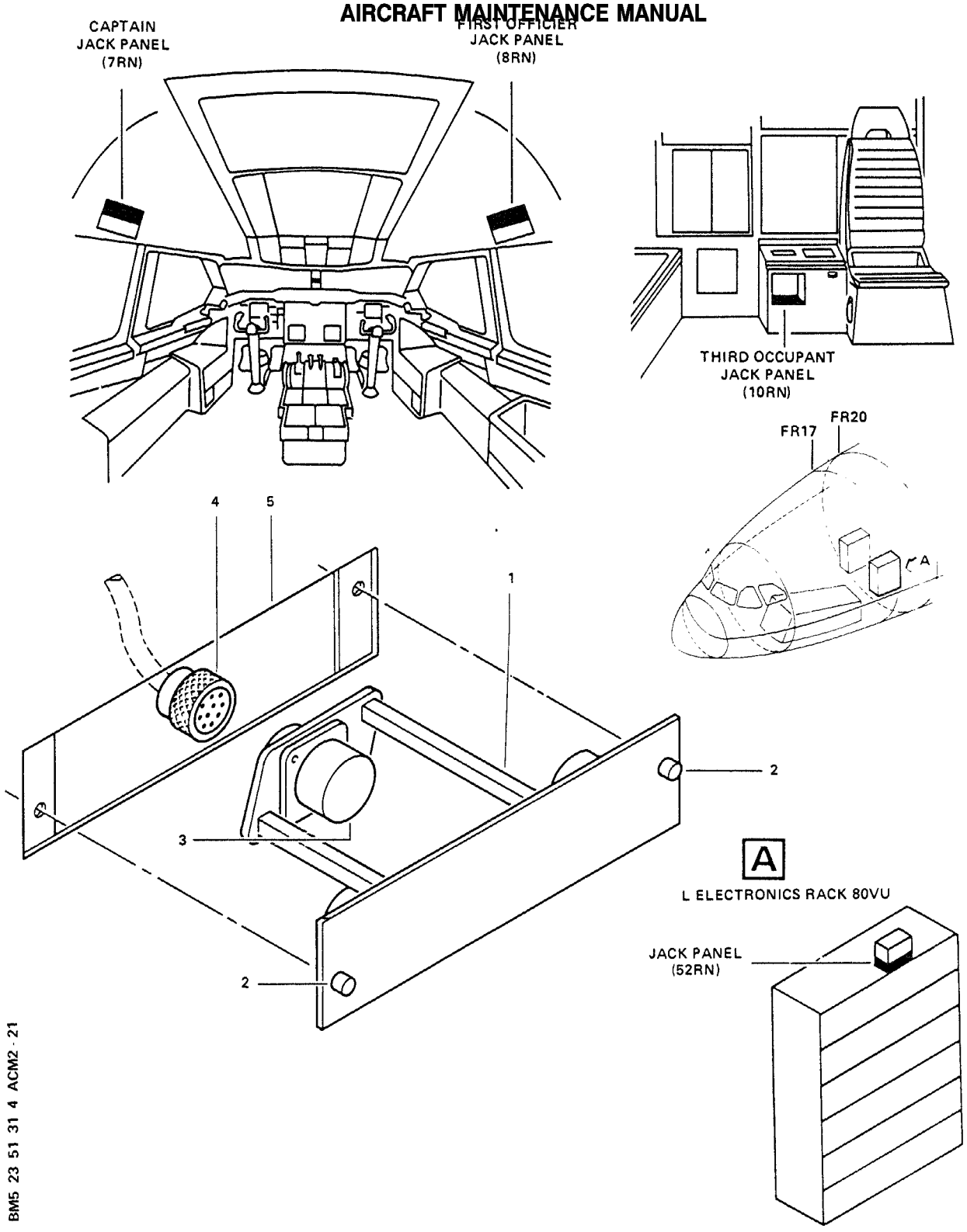
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/CTL PNL/CAPT | 30RN | 205/E19 |
| 132VU | INTEGRAL LT/C/B & OVHD & PED | 3LF | 322/N77 |

For 8RN

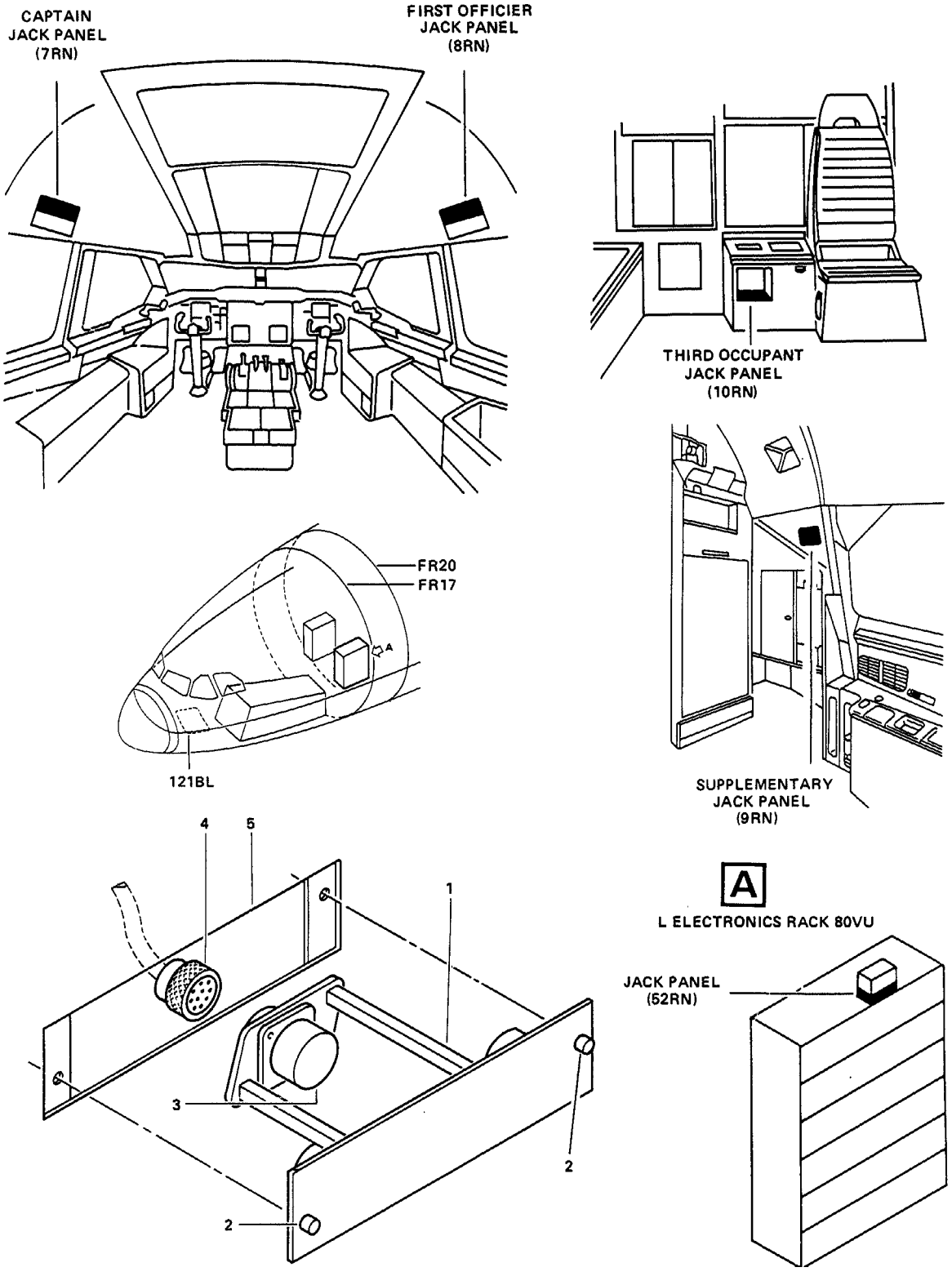
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/CTL PNL/F/O | 31RN | 205/E20 |
| 132VU | INTEGRAL LT/C/B & OVHD & PED | 3LF | 322/N77 |

For 10RN

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/CTL PNL/THIRD OCCUPANT | 32RN | 205/E18 |
| 132VU | INTEGRAL LT/C/B & OVHD & PED | 3LF | 322/N77 |




Jack Panel in Flight and Avionics Compartments
Figure 401




BM5 23 51 31 4 DCM0 00

Jack Panel in Flight and Avionics Compartments
Figure 402

**ON A/C 101-200,

For 9RN

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/CTL PNL/FOURTH OCCUPANT & AVNCS | 33RN | 205/E21 |
| 132VU | INTEGRAL LT/MAIN PNL & GLARESHIELD | 1LF | 322/N76 |

**ON A/C ALL

For 52RN

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AUDIO SYS/CTL PNL/FOURTH OCCUPANT & AVNCS | 33RN | 205/E21 |

B. Removal
(1)Unlock Dzus fasteners (2).
(2)Remove jack panel (1) from housing (5).
(3)Disconnect electrical connector (4)
(4)Blank off electrical connectors (3) and (4).

C. Installation
(1)Clean and inspect jack panel (1) interface and/or adjacent area.
(2)Remove blanking caps from electrical connectors (3) and (4) and check for correct condition of connectors.
(3)Connect electrical connectors (3) and (4).
(4)Insert jack panel in housing and lock Dzus fasteners (2).

**ON A/C 001-100,

(5)Remove safety clips and tags and close circuit breakers 30RN, 31RN, 32RN, 33RN, 3LF.

**ON A/C 101-200,

(5)Remove safety clips and tags and close circuit breakers 30RN, 31RN, 32RN, 33RN, 3LF and 1LF.

**ON A/C ALL

D. Tests
Test replacement component by operating flight interphone, checking that reception is normal (Ref. 23-41-00, P. Block 501, Operational Test).

E. Close-Up

Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

# STATIC DISCHARGING - DESCRIPTION AND OPERATION

## 1. General

Static dischargers allow dispersion of electrostatic charges accumulated by the aircraft during flight, to minimize interference in the radio-communication and navigation system.

## 2. Component Location

R **ON A/C 001-003,

R (Ref. Fig. 001)

R **ON A/C 004-200,

R (Ref. Fig. 002)

R **ON A/C 001-003,

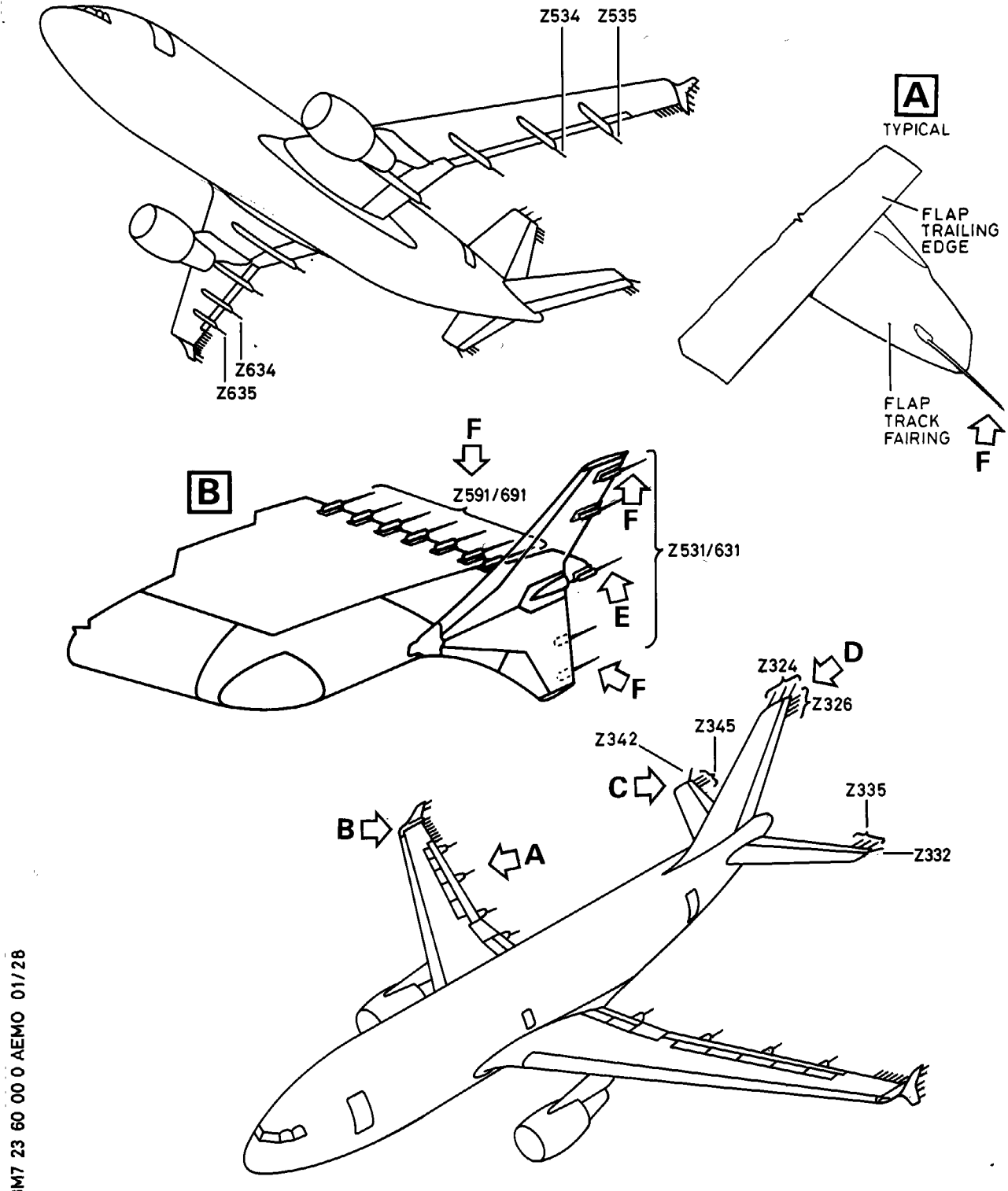
R (Ref. Fig. 003)

R **ON A/C 004-200,

R (Ref. Fig. 004)

R **ON A/C 001-003,

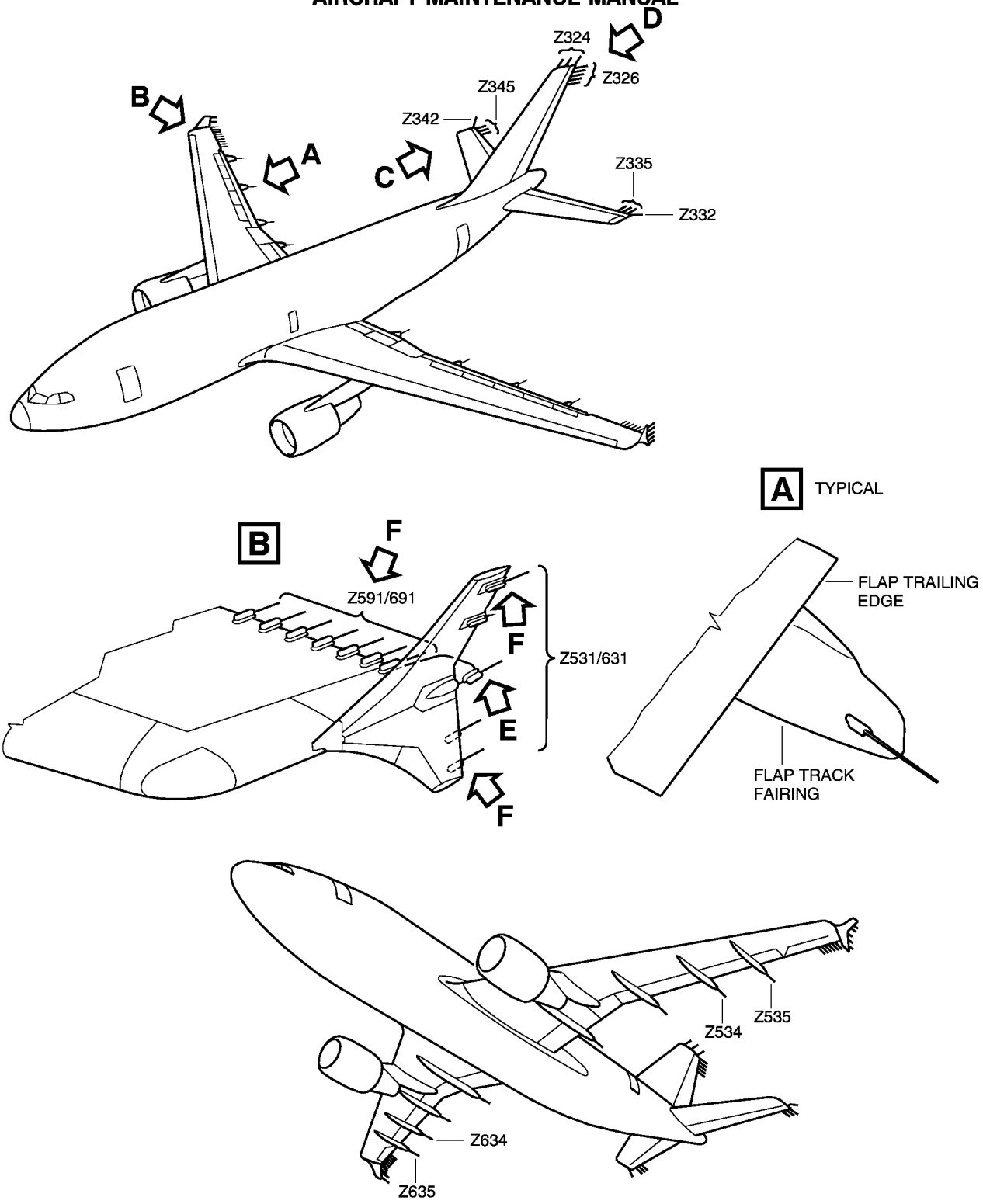
| | STATIC DISCHARGERS LOCATIONS | TOTAL | ZONE |
|---|---|---|---|
| R | Wing Tip | 6 | 531(631) |
| | Outboard Trailing Edge | 5 | 591(691) |
| R | Flap | 1 | 580(680) |
| | Flap Tracks | | |
| | Movable Fairings: | | |
| R | Fairing 2 | 1 | 532(632) |
| | Fairing 3 | 1 | 533(633) |
| | Fairing 4 | 1 | 534(634) |
| | Fairing 5 | 1 | 535(635) |
| R | | | |
| | Elevator | 4 | 335(345) |
| | Vertical Stabilizer | 2 | 324 |
| | Rudder | 5 | 326 |




BM7 23 60 00 0 AEMO 01/28

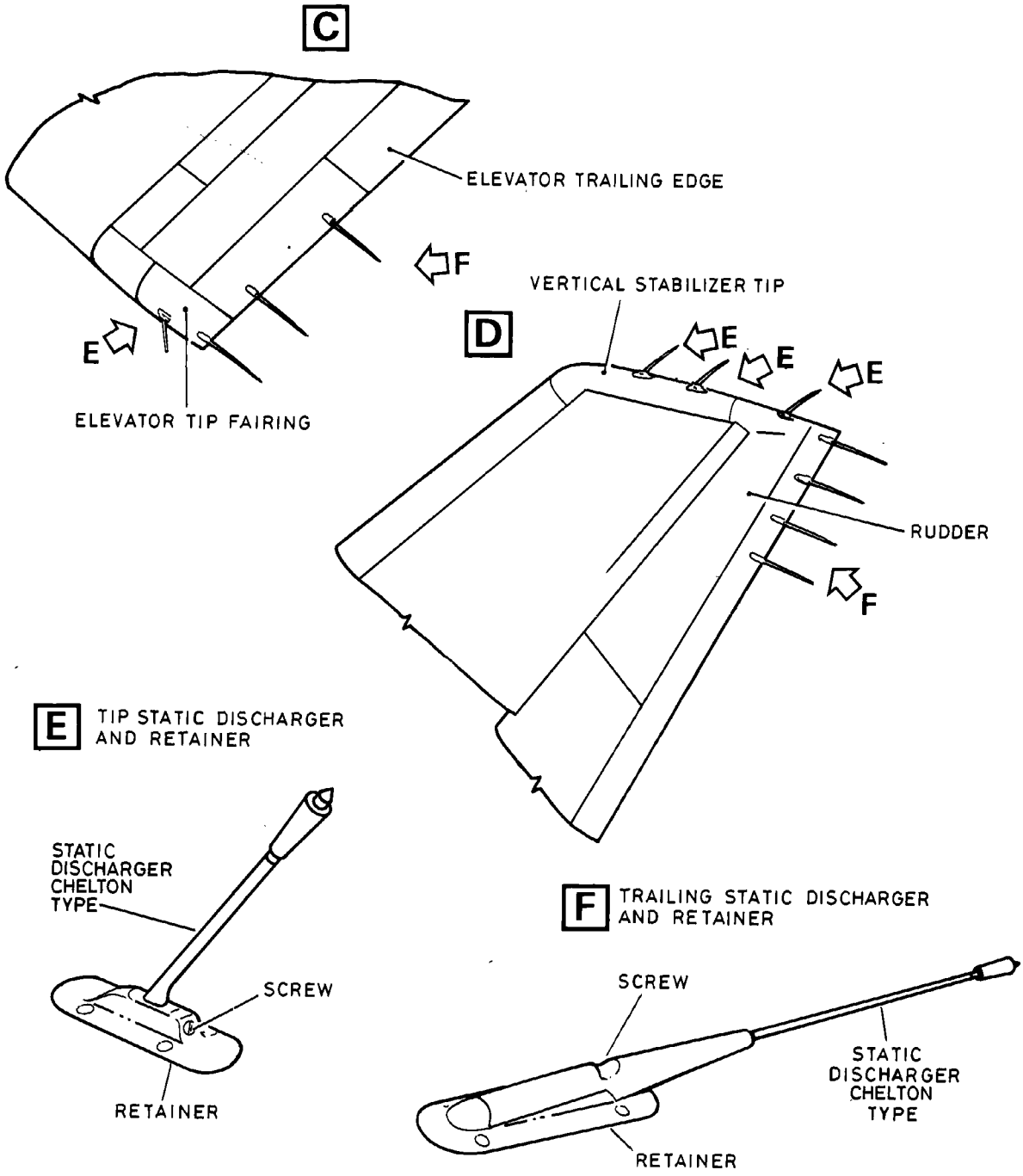
Static Dischargers - Locations
Figure 001

R



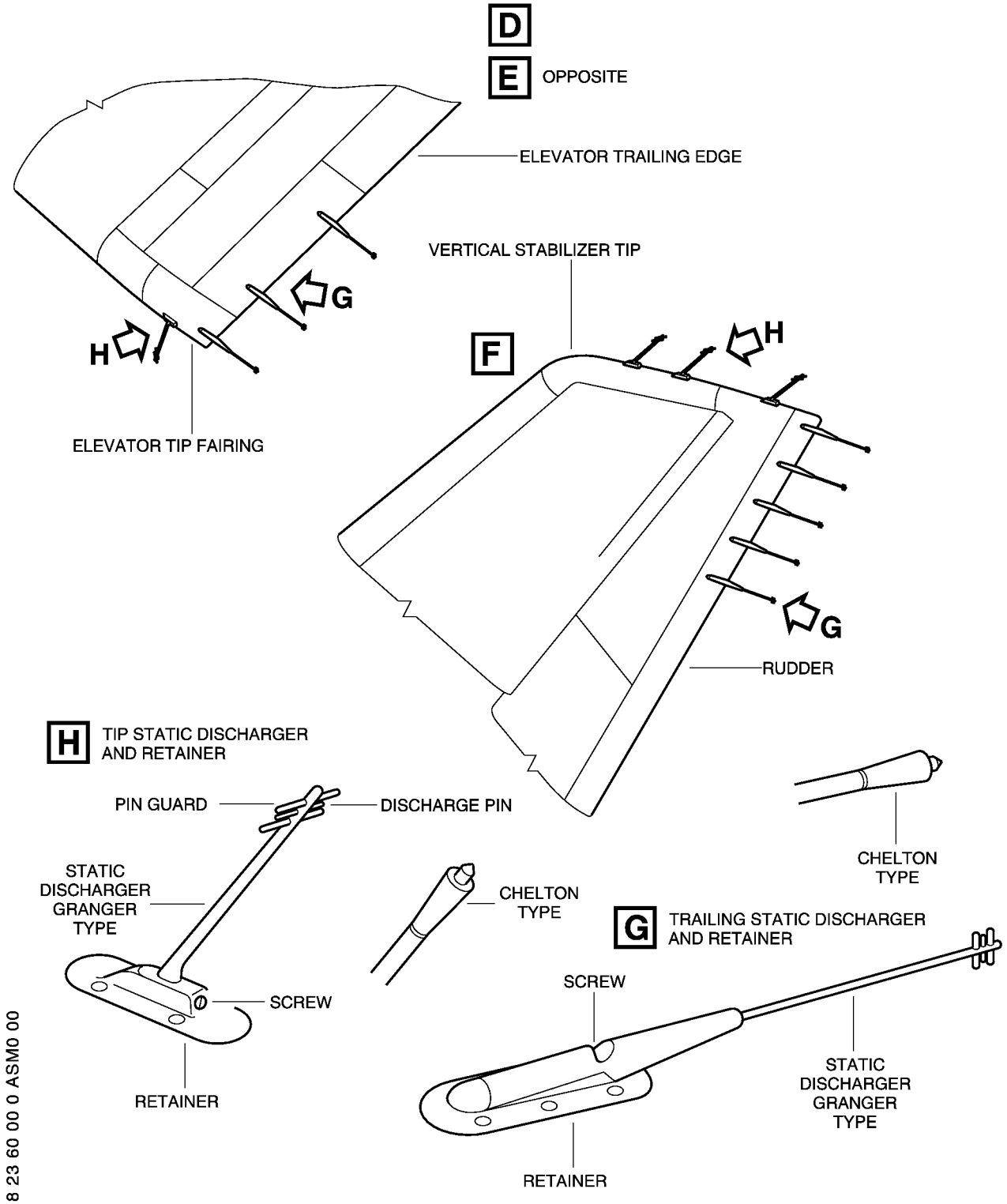

BM8 23 60 00 0 AVM0 00

Static Dischargers - Locations
Figure 002




BM7 23 60 00 0 AGMO 01/28

Static Dischargers - Further Details
Figure 003




Static Dischargers - Further Details
Figure 004

R

R **ON A/C 004-200,

| | STATIC DISCHARGERS LOCATIONS | TOTAL | ZONE |
|---|---|---|---|
| | Wing Tip | 6 | 531(631) |
| R | Outboard Trailing Edge | 5 | 591(691) |
| R | Flap | 1 | 580(680) |
| | Flap Tracks | | |
| | Movable Fairings: | | |
| | Fairing 2 | 1 | 532(632) |
| | Fairing 3 | 1 | 533(633) |
| | Fairing 4 | 1 | 534(634) |
| | Fairing 5 | 1 | 535(635) |
| | Elevator | 4 | 335(345) |
| | Vertical Stabilizer | 2 | 324 |
| R | Rudder | 6 | 326 |

R **ON A/C ALL

3. Description

A static discharging point consists of a permanently attached retainer and a removable static discharger held with a screw. Each aluminum retainer is attached to the aircraft structure by rivets or an electrically conductive adhesive.

The static discharge points are installed at the tips of the wings, elevator and vertical stabilizer, along the trailing edges of the outboard wings, elevators and rudder, and on the flap track movable fairings.

Two types of dischargers, Granger or Chelton, can be mounted in either trailing edge or tip mounted retainers.
- trailing edge mounted type.
- tip mounted type.

Granger type dischargers, colored yellow, consist of a moulded nylon rod housing a resistance element. At the end is a transverse discharge pin with two needle like discharge points, protected by guards to prevent possible injury to personnel.

Chelton type dischargers, colored black, consist of a tapered glass fiber rod with a discharge tip of carbon composite material.

4. Operation

The dischargers dissipate static electric charge in the following three ways:
- by reduction of the voltage level required to start corona discharge.
- by causing the discharge to take place at right angles to aerial coupling fields.
- by making regions of practically zero radio frequency field strength (null-field) and causing the discharge to occur in these regions.

WARNING : BEFORE PROCEEDING WITH MAINTENANCE WORK ON OR NEAR MECHANICAL FLIGHT CONTROLS OR PRIMARY FLIGHT CONTROL SURFACES, LANDING GEARS, ASSOCIATED DOORS OR ANY MOVING COMPONENT, MAKE CERTAIN THAT GROUND SAFETIES AND/OR WARNING NOTICES ARE IN CORRECT POSITION TO PREVENT INADVERTENT OPERATION OF CONTROLS.

WARNING : ON AIRCRAFT HAVING HF SYSTEMS, MAKE CERTAIN THAT HF CIRCUIT BREAKERS ARE OPEN, SAFETIED AND TAGGED BEFORE ATTEMPTING TO REMOVE OR TEST STATIC DISCHARGERS LOCATED ON VERTICAL STABILIZER.

1. Static Dischargers - Visual and Resistance Check

A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Ohmmeter |
| R B. | Megohmmeter - 500 Mohms 500 VDC, 1 mA max. |
| C. | Milliohmmeter |
| D. | Access Platform, 6 m (20 ft)<br>or |
| E. | Access Platform, 8 m (26 ft)<br>or |
| F. | Access Platform 17 m (56 ft) |
| G. | Warning Notices Prohibiting Operation of Elevators, Rudder and Flaps |
| H. | Circuit Breaker Safety Clips and Tags |

2. Procedure

A. Job Set-Up
(1)Put warning notices in flight compartment.
(2)Put access platform at the static dischargers to be checked.
(3)On aircraft having HF systems, open safety and tag the following circuit breakers before attempting to remove or test static dischargers located on the vertical stabilizer.

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO/NAV & COM/HF1 | 4RE1 | 106/D03 |
| 21VU | RADIO/NAV & COM/HF2 | 4RE2 | 106/D12 |
| 21VU | FAC1/28VDC | 306CC1 | 103/G03 |
| 21VU | FAC1/115VAC | 309CC1 | 103/G05 |
| 21VU | FAC1/26VAC | 305CC1 | 103/G07 |
| 21VU | FAC2/26VAC | 305CC2 | 103/G08 |
| 21VU | FAC2/115VAC | 309CC2 | 103/G10 |
| 21VU | FAC2/28VDC | 306CC2 | 103/G12 |

B. Check

WARNING : SOME DISCHARGERS HAVE NEEDLE-LIKE PINS WHICH CAN CAUSE INJURY. ALL ARE RIGID AND A DANGER TO EYES.

CAUTION : DO NOT DAMAGE COMPONENTS OR AIRCRAFT STRUCTURE WITH SHARP END PRODS.

(1)Visual check; at each discharger:
(a)Visually make certain dischargers are secure on retainer.
(b)Make certain there is no lightning damage as shown by burned or pitted discharger retainer.

- Granger dischargers (color yellow):-

(c)Make certain there are no bent or broken pins

NOTE: Broken plastic guards do not affect discharger performance.

- Chelton dischargers (color black):-

(d)Make certain carbon composite tip is not missing.
(e)Make certain sleeving is not split or eroded.
(f)Gently flex to make certain that discharger is not broken internally.

R (2)Resistance check; at each static discharger retainer:
R (a)For static dischargers of metallic structure, measure resistance between the static discharger retainer and the adjacent structure using a milliohmmeter. Refer to the table of maximum permissable resistance values.
R (b)For static dischargers of composite structure, measure resistance between the static discharger retainer and the adjacent structure using an ohmmeter. Refer to the table of maximum permissable resistance values.
R (c)Install a new discharger if resistance is out of the tolerance limits in the table of maximum permissable resistance values.
R (3)Resistance check; at each static discharger tip (tip TYPE A and trailing edge TYPE B):
R (a)For static dischargers of metallic or composite structure, measure resistance between the static discharger retainer and the static discharger tip, using a megohmmeter. Refer to the table of maximum permissable resistance values.
R (b)Install a new discharger if resistance is out of the tolerance limits in the table of maximum permissable resistance values.

R C. Table of Maximum Permissible Resistance Values

| CATEGORY | RESISTANCE MEASUREMENTS | LOCATION | HOW TESTED |
|---|---|---|---|
| (1) | (2) | (3) | (4) |
| Static | 50 milliohms | At the respective | Using a |

| | CATEGORY | RESISTANCE MEASUREMENTS | LOCATION | HOW TESTED |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| | dischargers of metallic structure. | (maximum) | structure tip or trailing edge interfaces:<br>- elevator<br>- vertical stabilizer<br>- rudder<br>- wing<br>- aileron. | milliohmeter:<br>- measure the resistance value between the discharger retainer and the adjacent structure. |
| R | Static dischargers of composite structure. | 50 kilo-ohms (maximum) | At the respective structure tip or trailing edge interfaces:<br>- elevator<br>- vertical stabilizer<br>- rudder<br>- wing<br>- aileron. | Using an ohmmeter:<br>- measure the resistance value between the discharger retainer and the adjacent structure. |
| | Static dischargers of the flap track fairings. | 5 Megohms (maximum) | Flap track movable fairings:<br>- No.2 Z532(632)<br>- No.3 Z533(633)<br>- No.4 Z534(634)<br>- No.5 Z535(635)<br>- No.6 Z536(636) | Using a megohmeter:<br>- measure the resistance value between the discharger retainer on the flap track fairing and the aircraft structure. |
| | Static dischargers of TYPE A, (Tip type). Granger make, color coded Yellow or Chelton make, color coded Black. | Between 6 and 120 Megohms | At the respective structure tip or trailing edge interfaces:<br>- elevator<br>- vertical stabilizer<br>- rudder<br>- wing<br>- flap movable fairing<br>- aileron. | Using a megohmmeter:<br>- measure the resistance value between the discharger retainer and the discharger tip |
| | Static dischargers | 6 and 200 Megohms | At the respective structure tip or | Using a megohmmeter: |

| CATEGORY | RESISTANCE MEASUREMENTS | LOCATION | HOW TESTED |
|---|---|---|---|
| (1) | (2) | (3) | (4) |
| of TYPE B, (Trailing edge type). Granger make, color coded Yellow or Chelton make, color coded Black. | | trailing edge interfaces: - elevator - vertical stabilizer - rudder. | - measure the resistance value between the discharger retainer and the discharger tip. |

NOTE: Put megohmmeter crocodile-clip jaws over a small piece of damp sponge or fine wire wool wrapped around the discharger tip to obtain the most accurate reading.

D. Close-Up

(1) On aircraft with HF systems, remove the safety clips and tags and close the following circuit breakers, 4RE1, 4RE2, 306CC1, 309CC1, 305CC1, 305CC2, 309CC2 and 306CC2.

(2) Remove the access platform(s).

(3) Make sure that the working area is clean and clear of tools and miscellaneous items of equipment.

(4) Remove the warning notices.

STATIC DISCHARGER - REMOVAL/INSTALLATION

WARNING : BEFORE PROCEEDING WITH MAINTENANCE WORK ON OR NEAR MECHANICAL FLIGHT CONTROLS OR PRIMARY FLIGHT CONTROL SURFACES, LANDING GEARS, ASSOCIATED DOORS OR ANY MOVING COMPONENT, MAKE CERTAIN THAT GROUND SAFETIES AND/OR WARNING NOTICES ARE IN CORRECT POSITION TO PREVENT INADVERTENT OPERATION OF CONTROLS.

WARNING : ON AIRCRAFT HAVING HF SYSTEMS, MAKE CERTAIN THAT HF CIRCUIT BREAKERS ARE OPEN, SAFETIED AND TAGGED BEFORE ATTEMPTING TO REMOVE OR TEST STATIC DISCHARGERS LOCATED ON VERTICAL STABILIZER.

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Megohmmeter |
| B. | Access Platform, 6 m (20 ft) |
| | or |
| C. | Access Platform, 8 m (26 ft.) |
| | or |
| D. | Access Platform, 15 m (50 ft.) |
| E. | Warning Notices Prohibiting Operation of Elevators, Rudder and Flaps |
| F. | Circuit Breaker Safety Clips and Tags |

R Referenced Procedures

| | |
|---|---|
| R - 23-60-00, P. Block 601 | Static Discharging |

2. Procedure

(Ref. Fig. 401)

NOTE : As removal/installation procedures are identical for all static dischargers, only one typical removal/installation procedure is given.

A. Job Set-Up

(1)Position warning notices in flight compartment.

(2)Position access platform at static dischargers to be replaced.

R (3)On aircraft having HF systems, open safety and tag the following
R circuit breakers before you attempt to remove or test the static
R dischargers located on the vertical stabilizer.

| R PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| R 21VU | RADIO/NAV & COM/HF1 | 4RE1 | 106/D03 |
| R 21VU | RADIO/NAV & COM/HF2 | 4RE2 | 106/D12 |
| R 21VU | FAC1/28VDC | 306CC1 | 103/G03 |
| R 21VU | FAC1/115VAC | 309CC1 | 103/G05 |
| R 21VU | FAC1/26VAC | 305CC1 | 103/G07 |
| R 21VU | FAC2/26VAC | 305CC2 | 103/G08 |

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | FAC2/115VAC | 309CC2 | 103/G10 |
| 21VU | FAC2/28VDC | 306CC2 | 103/G12 |

B. Removal

WARNING : SOME DISCHARGERS HAVE NEEDLE-LIKE PINS WHICH CAN CAUSE INJURY. ALL ARE RIGID AND A DANGER TO EYES.

(1)Remove the screw (1).
(2)Remove the static discharger tip (2) from the static discharger retainer (3) by inserting a screwdriver between the static discharger tip (2) and the static discharger retainer (3) and twisting the screwdriver.

C. Preparation of Replacement Component
(1)Make sure that the new static discharger tip (2) does not show evidence of defect, corrosion, or traces of preservative.
(2)Make sure that the static discharger retainer (3) on the aircraft is clean and in the correct condition.

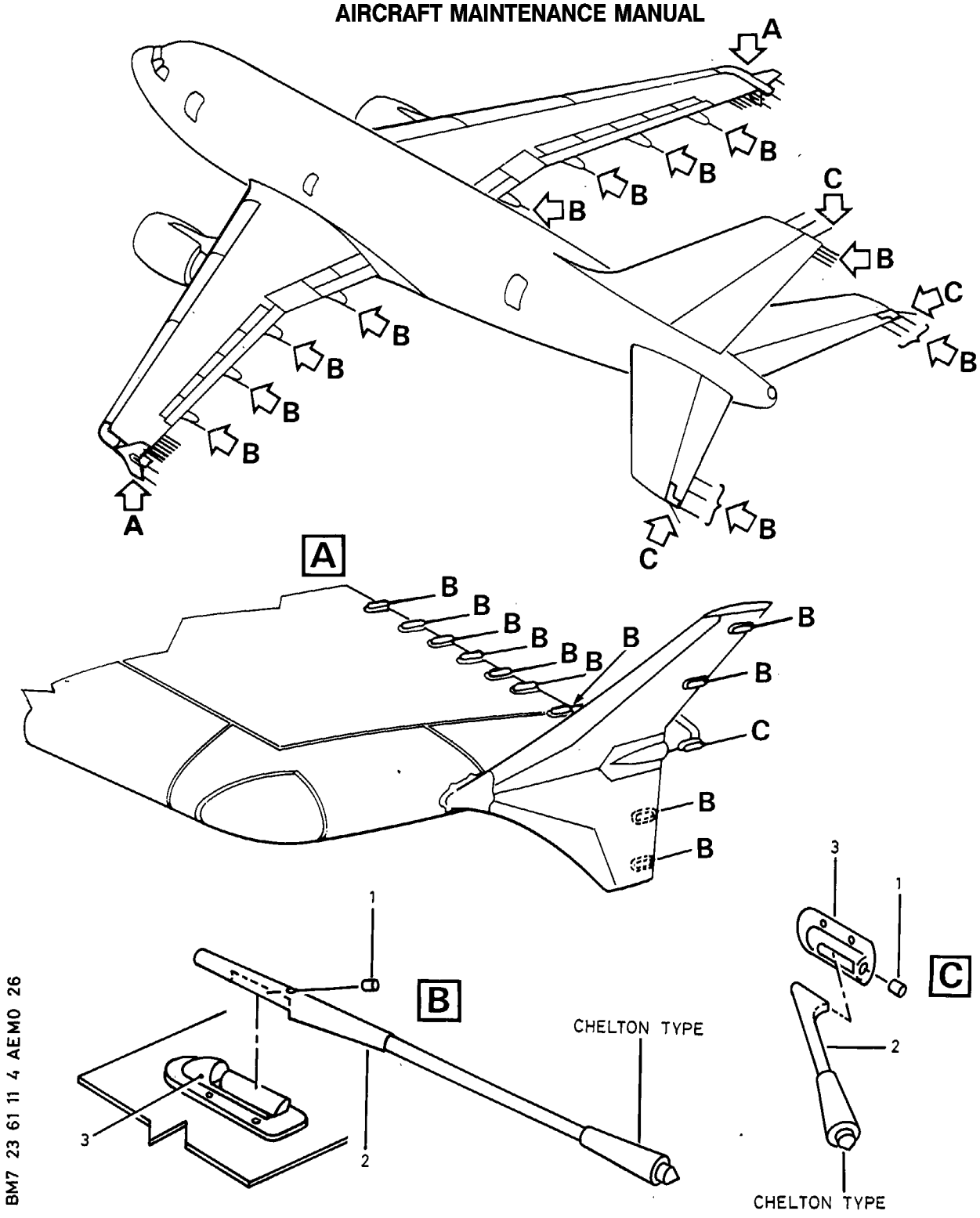
D. Installation
(1)Install the new static discharger tip (2) on the static discharger retainer (3).
(2)Install and tighten the screw (1).

E. Test

CAUTION : DO NOT DAMAGE COMPONENTS OR AIRCRAFT STRUCTURE WITH THE SHARP-END PRODS.

(1)Measure resistance between the static discharger tip (2) and the static discharger retainer (3) as follows:
(a)Put the megohmmeter crocodile-clip jaws over a small piece of damp sponge or fine wire wool wrapped around the static discharger tip (2).
(b)Use a megohmmeter to measure the resistance between the point of the static discharger tip (2) and the static discharger retainer (3) (Ref. 23-60-00, P. Block 601).
(c)Install a new static discharger tip (2) if the resistance is out of the maximum permissable resistance values (Ref. 23-60-00, P. Block 601).

F. Close-Up
(1)On aircraft with HF systems, remove the safety clips and tags and close the following circuit breakers, 4RE1, 4RE2, 306CC1, 309CC1, 305CC1, 305CC2, 309CC2 and 306CC2.
(2)Remove the access platform(s).
(3)Make sure that the working area is clean and clear of tools and




Static Dischargers - Installation
Figure 401

miscellaneous items of equipment.

(4)Remove the warning notices.

## STATIC DISCHARGER RETAINER - REMOVAL/INSTALLATION

**WARNING : BEFORE PROCEEDING WITH MAINTENANCE WORK ON OR NEAR MECHANICAL FLIGHT CONTROLS OR PRIMARY FLIGHT CONTROL SURFACES, LANDING GEARS, ASSOCIATED DOORS OR ANY MOVING COMPONENT, MAKE CERTAIN THAT GROUND SAFETIES AND/OR WARNING NOTICES ARE IN CORRECT POSITION TO PREVENT INADVERTENT OPERATION OF CONTROLS.**

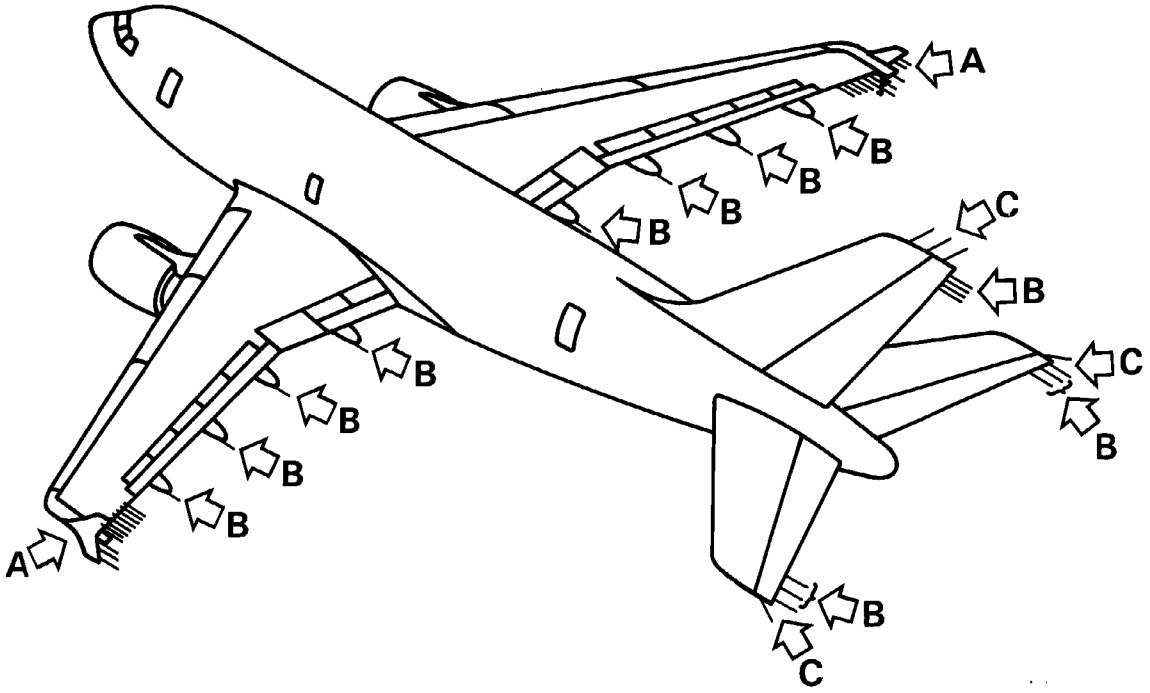
**WARNING : ON AIRCRAFT HAVING HF SYSTEMS, MAKE CERTAIN THAT HF CIRCUIT BREAKERS ARE OPEN, SAFETIED AND TAGGED BEFORE ATTEMPTING TO REMOVE OR TEST STATIC DISCHARGERS LOCATED ON VERTICAL STABILIZER.**

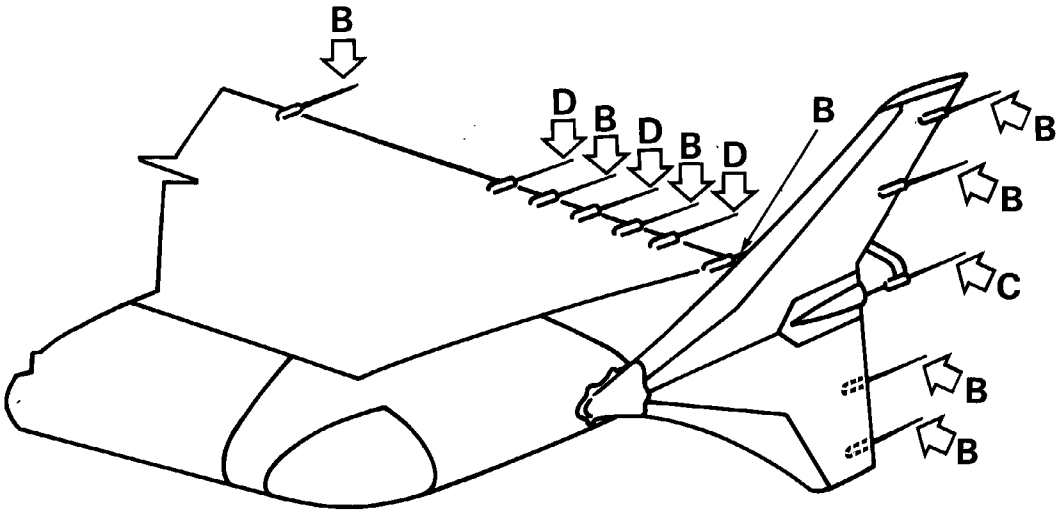
1. Equipment and Materials

| | ITEM | DESIGNATION |
|---|---|---|
| | A. | Access Platform 6 to 8 m (20 to 26 ft) |
| | | or |
| | B. | Access Platform 15 m (50 ft) |
| | C. | Circuit Breaker Safety Clips and Tags |
| | D. | Warning Notices - Prohibiting Operation of Elevators, Rudder and Flaps |
| | E. Material No. 11-003 | Cleaning Agents (Ref. 20-31-00) |
| R | F. | Abrasive Paper (Grade 448) |
| R | G. | Lint-free Cloth |
| R | H. | Masking Paper |
| R | J. | Masking Tape |
| R | K. | Ohmmeter |
| R | L. | Rivets |
| R | M. | Rivet Gun and Accessories |
| R | N. Material No. 09-001 | Sealants (Ref. 20-31-00) |
| R | P. | Plastic Scraper |
| R | Q. | Tool, sharp, broad bladed - Retainer Removal |
| | Referenced Procedures | |
| R | - 23-60-00, P. Block 601 | Static Discharging |
| | - 23-61-11, P. Block 401 | Static Discharger |
| | - 27-50-21, P. Block 401 | Flap Track Fairings |
| | - 51-40-20, P. Block 1 | Fastener Installation and Removal (SRM) |
| | - 51-75-10, P. Block 801 | Repair of Paint Coatings |
| | - 55-24-11, P. Block 401 | Elevator Tips and Inboard End Caps |
| | - 55-34-11, P. Block 401 | Vertical Stabilizer Tip |
| | - 55-44-11, P. Block 401 | Rudder Tip |
| | - 57-30-11, P. Block 401 | Wing Tip - Structure Complete |

2. Procedure
(Ref. Fig. 401)
(Ref. Fig. 402)

A. Job Set-Up
(1)Position warning notices in flight compartment.
(2)Position access platform at the static discharger retainer to be

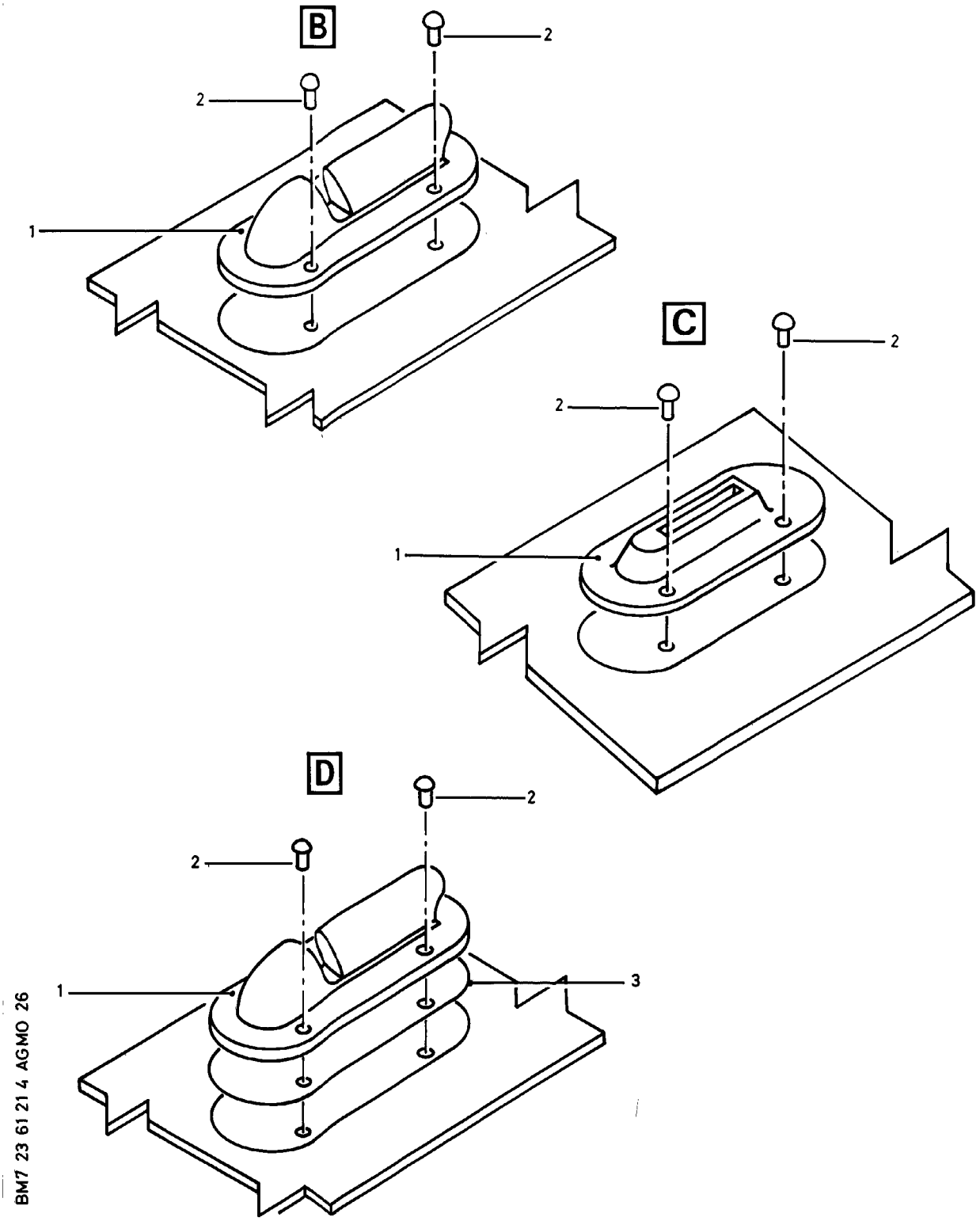



BM7 23 61 21 4 AEMO 26

Static Dischargers - Locations
Figure 401

R




Static Dischargers - Retainers
- Installation Details
Figure 402

R

replaced.

(3)On aircraft having HF systems. Before you attempt to remove, or test, static dischargers located on the vertical stabilizer. You must open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | RADIO - NAV & COM - HF1 | 4RE1 | 106/D03 |
| 21VU | RADIO - NAV & COM - HF2 | 4RE2 | 106/D12 |
| 21VU | FAC1/28VDC | 306CC1 | 103/G03 |
| 21VU | FAC1/115VAC | 309CC1 | 103/G05 |
| 21VU | FAC1/26VAC | 305CC1 | 103/G07 |
| 21VU | FAC2/26VAC | 305CC2 | 103/G08 |
| 21VU | FAC2/115VAC | 309CC2 | 103/G10 |
| 21VU | FAC2/28VDC | 306CC2 | 103/G12 |

B. Removal

WARNING : SOME DISCHARGERS HAVE NEEDLE-LIKE PINS WHICH CAN CAUSE INJURY. ALL ARE RIGID AND A DANGER TO EYES.

(1)Remove static discharger (Ref. 23-61-11, P. Block 401).
(2)Mark position of discharger base beyond cleaning area with a non-destructive marking.
(3)For removal of static discharger retainers (1) at their respective stucture tip, or trailing-edge interfaces:
(a)Remove flap-track movable fairing (Ref. 27-50-21, P. Block 401).
(b)Remove elevator tip (Ref. 55-24-11, P. Block 401).
(c)Remove vertical stabilizer tip (Ref. 55-34-11, P. Block 401).
(d)Remove rudder tip (Ref. 55-44-11, P. Block 401).
(e)Remove wing tip (Ref. 57-30-11, P. Block 401).
(4)Remove rivets (2) (Ref. 51-40-20, P. Block 1, SRM).
(5)Using the plastic scraper, remove fillet of sealant from one edge of retainer (1).

CAUTION : DO NOT DAMAGE AIRCRAFT SURFACES.

(6)Insert removal tool under edge of retainer (1) and prize off retainer.

C. Preparation of Replacement Component

R (1)Make sure that the new retainer (1), does not show evidence of defect,
R corrosion or traces of storage material.
R (2)Examine the retainer (1) (and the shim (3) where fitted) and the
R aircraft interface for the correct condition.

D. Installation

R (1)Before the retainer (1) is installed:
R (a)Drill the new retainer (1) to match with the existing holes.
R (b)Protect the area surrounding the position of the retainer (1) with
R masking tape and paper.

R (c)Lightly abrade and polish the aircraft structure and the retainer (1) (and the shim (3) where fitted), with abrasive paper.
R (d)Remove the dust with a dry, lint-free cloth.
R (e)Clean the aircraft structure and the retainer (1) (and the shim (3) where fitted) interfaces thoroughly with cleaning agent (Material No. 11-003).

R NOTE : Start to apply Sealant (Material No. 09-001) to the retainer (1) interface, within 5 minutes after it has been cleaned, to prevent aluminium oxidation.

R (2)Install the retainer (1):
R (a)Apply sealant (Material No. 09-001) to the aircraft structure (and the shim (3) where fitted) and the retainer (1) interfaces.
R (b)Affix the retainer (1) (and the shim (3) where fitted) firmly to the aircraft surface. Squeeze out excess sealant.
R (c)Make sure that the retainer (1) is aligned with the non-destructive marking.
R (d)Wet assemble the rivets (2) (Ref. 51-40-20, P. Block 1, SRM) immediately after applying the sealant.
R (e)Remove the excess sealant, but make sure that a fillet of sealant has exuded around the edges of the retainer (1).
R (3)On completion of the retainer (1) installation, at the respective structure tip, or trailing-edge interface:
R (a)Install the movable fairing (Ref. 27-50-21, P. Block 401).
R (b)Install the elevator tip, (Ref. 55-24-11, P. Block 401).
R (c)Install the vertical stabilizer tip (Ref. 55-34-11, P. Block 401).
R (d)Install the rudder tip (Ref. 55-44-11, P. Block 401).
R (e)Install the wing tip (Ref. 57-30-11, P. Block 401).
R (4)If required, restore the protective finish with primary and top coats to match the existing paint finish (Ref. 51-75-10, P. Block 801).

E. Test
R (1)Measure the resistance between the new static discharger retainers (1) and the aircraft adjacent structure using an ohmmeter (Ref. 23-60-00, P. Block 601).

F. Close-Up
(1)Install static discharger on new retainer (Ref. 23-61-11, P. Block 401).
(2)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(3)On aircraft having HF systems, remove the safety clips and tags and close circuit breakers 4RE1, 4RE2, 306CC1, 309CC1, 305CC1, 305CC2, 309CC2 and 306CC2.
(4)Remove access platform(s).
(5)Remove warning notices.

## 1. General

The cockpit voice recorder (CVR) is designed to record crew conversation and communications on a magnetic tape when at least one main engine is running or up to five minutes after the second of the two main engines is shut down irrespective of which engine is shut down first. The system can also operate in manual mode on the ground. The recorder is a four-track system and all tracks are recorded simultaneously. The magnetic tape has a total recording time of 30 minutes. When the tape is fully recorded, the system progressively erases recordings made in the previous 30 minutes and simultaneously records new information; thus only information recorded in the last 30 minutes of operation is retained. The recorded information can be intentionally erased when the aircraft is on the ground with the parking brake control handle pulled up and locked, electrical power available and up to five minutes after second engine shut-down. Bulk erasure is also possible during manual operation of the system.

## 2. Component Location

**ON A/C 001-003,

(Ref. Fig. 001)

R **ON A/C 004-200,

(Ref. Fig. 002)

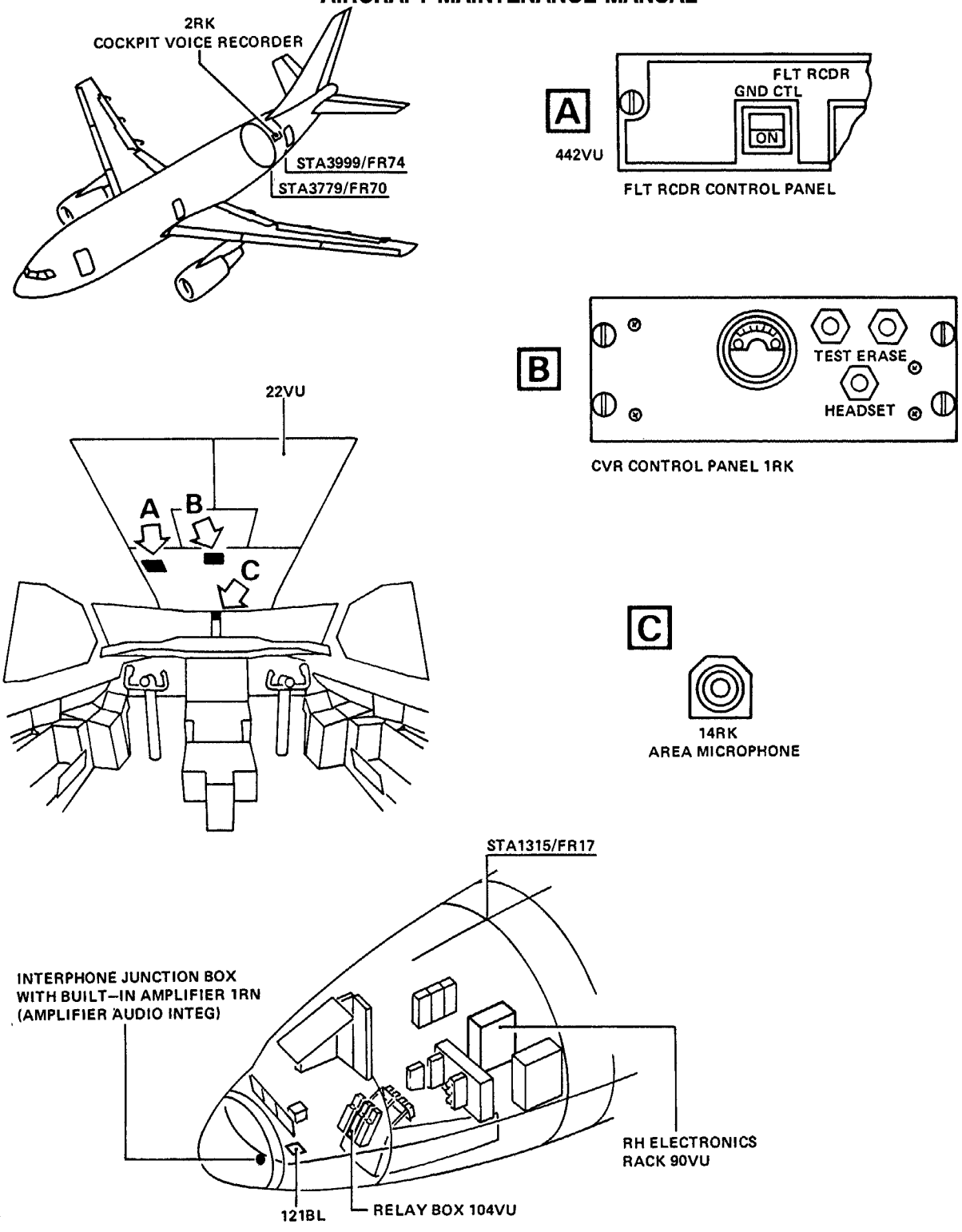
**ON A/C 001-003,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF |
|---|---|---|---|---|---|
| 1RK | CONTROL UNIT-COCKPIT VOICE RECORDER | | 210 | 831/841 | 23-71-00 |
| 2RK | RECORDER-COCKPIT VOICE | | 171 | 162AZ | 23-71-00 |
| 6RK | RELAY | 90VU | 122 | 131/132AZ | 23-71-00 |
| 7RK | RELAY | 90VU | 122 | 131/132AZ | 23-71-00 |
| 14RK | MICROPHONE-AREA | | 210 | 831/841 | 23-71-00 |
| 23RK | RELAY-TIME DELAY | 90VU | 122 | 131/132AZ | 23-71-00 |
| 24RK | RELAY | 90VU | 122 | 131/132AZ | 23-71-00 |
| 25RK | RELAY | 90VU | 122 | 131/132AZ | 23-71-00 |
| 51TU | SWITCH-MAGNETIC LATCH | 442VU | 210 | 831/841 | 23-71-00 |
| 38VD | DIODE | 90VU | 122 | 131/132AZ | 23-71-00 |
| 39VD | DIODE | 90VU | 122 | 131/132AZ | 23-71-00 |

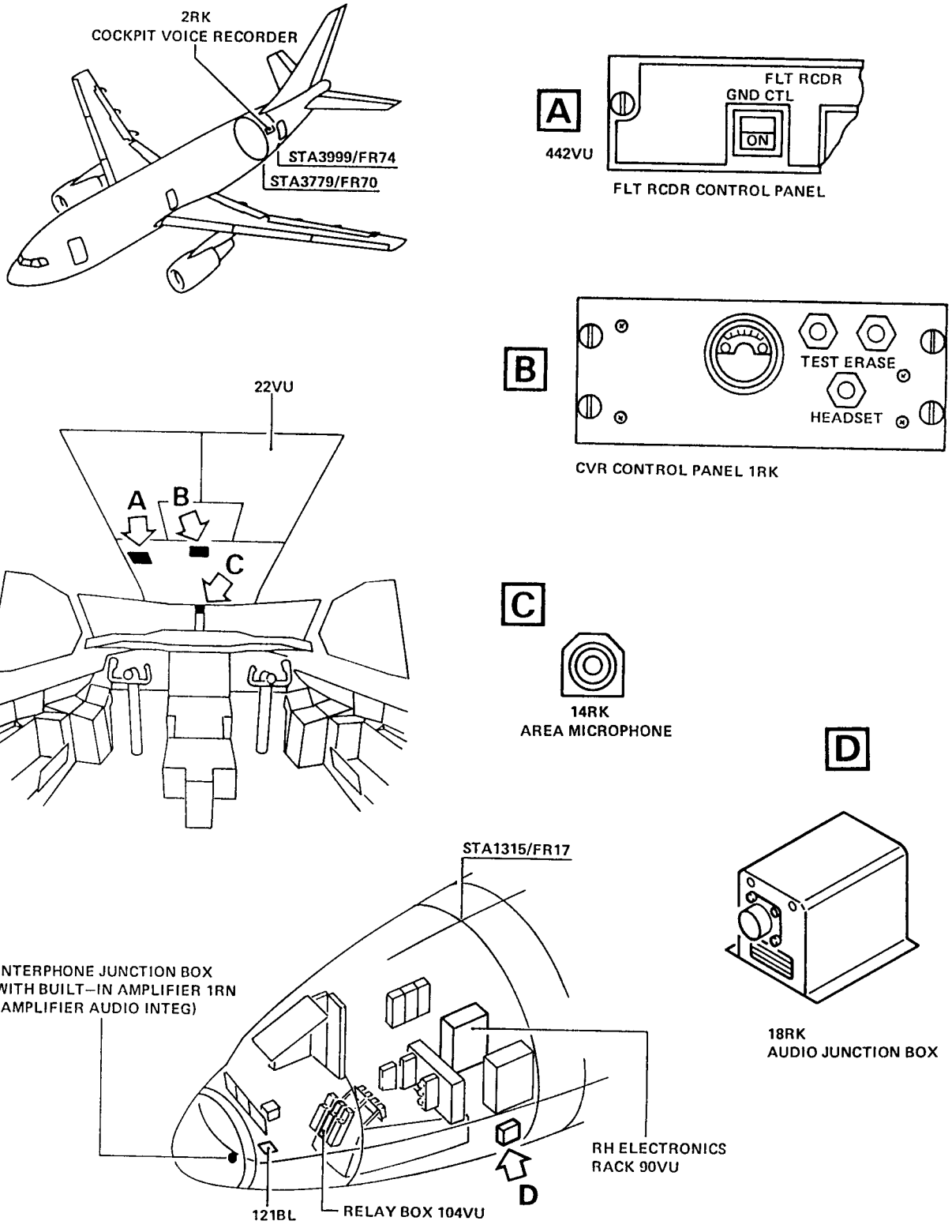
| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF |
|---|---|---|---|---|---|
| 1RN | JUNCTION BOX-INTERPHONE | | 121 | 131/ 132AZ | 23-41-00 |
| 18GB | RELAY | 104VU | 120 | | 32-30-00 |
| 21GB | RELAY | 104VU | 120 | | 32-30-00 |
| 115GB | RELAY | 104VU | | | 32-62-00 |
| S1-295 | PRESSURE SWITCH-LOW OIL, ENG 1 | | 435 | 435AL | 79-34-00 |
| S1-295 | PRESSURE SWITCH-LOW OIL, ENG 2 | | 445 | 445AL | 79-34-00 |
| 9ES | RELAY | 105VU | | | 79-34-00 |
| 10ES | RELAY | 105VU | | | 79-34-00 |

R **ON A/C 004-200,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF |
|---|---|---|---|---|---|
| 1RK | CONTROL UNIT-COCKPIT VOICE RECORDER | | 210 | 831/841 | 23-71-12 |
| 2RK | RECORDER-COCKPIT VOICE | | 171 | 162AZ | 23-71-35 |
| 6RK | RELAY | 90VU | 122 | 131/ 132AZ | 23-71-00 |
| 7RK | RELAY | 90VU | 122 | 131/ 132AZ | 23-71-00 |
| 14RK | MICROPHONE-AREA | | 210 | 831/841 | 23-71-13 |
| 18RK | AUDIO JUNCTION BOX | | 121 | | |
| 23RK | RELAY-TIME DELAY | 90VU | 122 | 131/ 132AZ | 23-71-00 |
| 24RK | RELAY | 90VU | 122 | 131/ 132AZ | 23-71-00 |
| 25RK | RELAY | 90VU | 122 | 131/ 132AZ | 23-71-00 |
| 51TU | SWITCH-MAGNETIC LATCH | 442VU | 210 | 831/841 | 23-71-00 |
| 38VD | DIODE | 90VU | 122 | 131/ 132AZ | 23-71-00 |
| 39VD | DIODE | 90VU | 122 | 131/ 132AZ | 23-71-00 |
| 1RN | JUNCTION BOX-INTERPHONE | | 121 | 131/ 132AZ | 23-41-00 |
| 18GB | RELAY | 104VU | 120 | | 32-30-00 |
| 21GB | RELAY | 104VU | 120 | | 32-30-00 |
| 115GB | RELAY | 104VU | | | 32-62-00 |
| S1-295 | PRESSURE SWITCH-LOW OIL, ENG 1 | | 435 | 435AL | 79-34-00 |
| S1-295 | PRESSURE SWITCH-LOW OIL, ENG 2 | | 445 | 445AL | 79-34-00 |
| 9ES | RELAY | 105VU | | | 79-34-00 |
| 10ES | RELAY | 105VU | | | 79-34-00 |




Component Location
Figure 001




Component Location
Figure 002

**ON A/C ALL

3. System Description

**ON A/C 001-003,

(Ref. Fig. 003)

R **ON A/C 004-200,

(Ref. Fig. 004)

**ON A/C ALL

The cockpit voice recorder system consists of:

A. Control Unit (1RK) which provides recorder test, bulk erase and audio monitoring facilities. A meter is mounted on the front of the unit for monitoring the recording level during recorder test.

B. Cockpit Voice Recorder (2RK) which records communications:
- received and transmitted by radio
- intercom conversations between crew members
- conversation transmitted over the public address system
- direct between crew members in the cockpit and all audio warnings.
A headset socket is mounted in front of the recorder enabling all four channels to be monitored simultaneously. Facility is also made for mounting an underwater location beacon on the front of the recorder.

C. Remote Microphone (14RK) for monitoring direct conversations between crew members and audio warnings in the cockpit.

D. Circuit Breaker 5RK supplying relays 6RK, 7RK, 23RK, 24RK, 25RK and magnetic latch switch (51TU) with 28VDC electrical power.

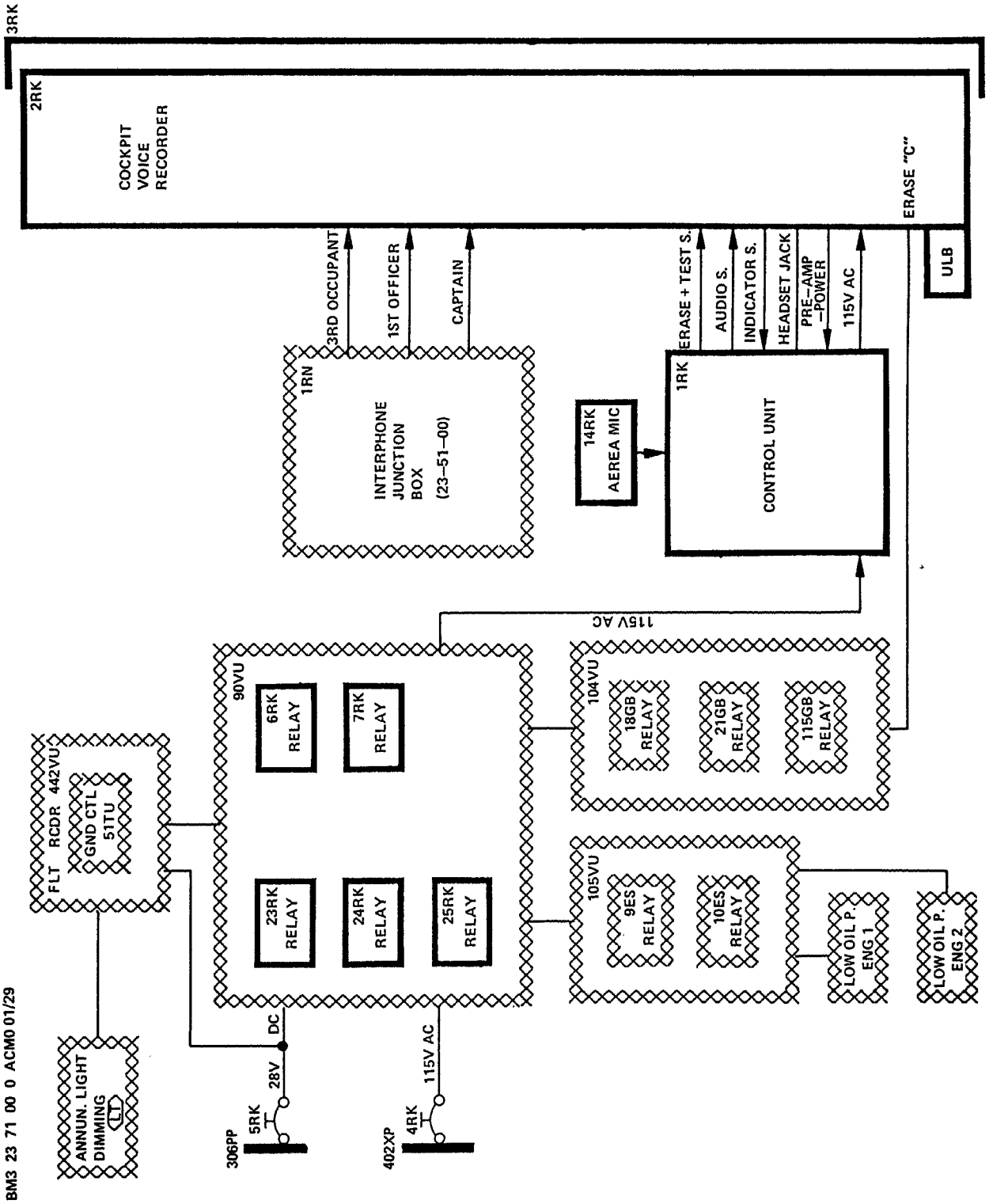
E. Circuit Breaker 4RK supplying cockpit voice recorder via relay 6RK and/or 7RK contacts with 115VAC electrical power.

F. Two relays 6RK and 7RK which automatically energize and de-energize the voice recorder under specified conditions.

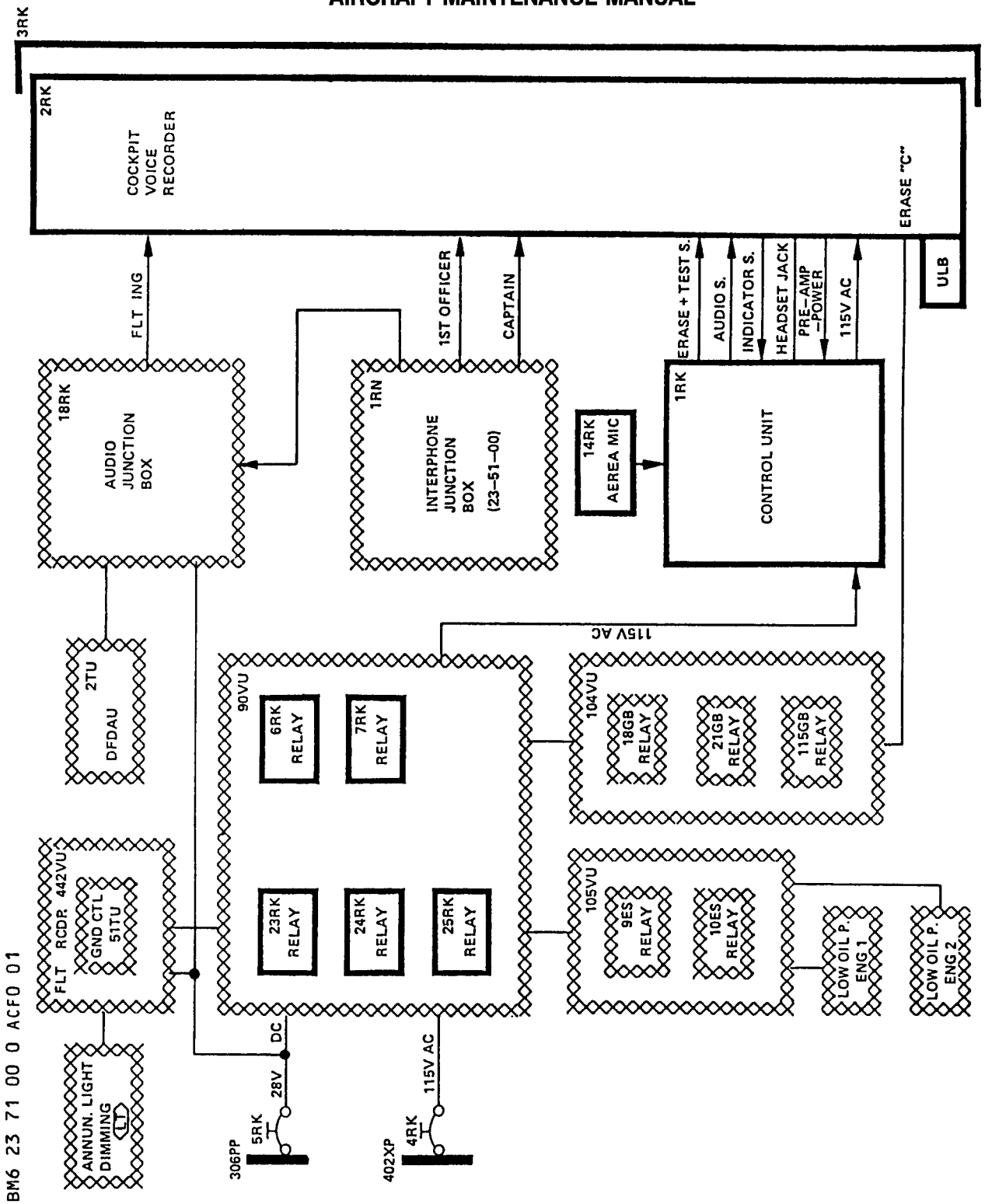
G. Time Delay Relay (23RK) enabling the cockpit voice recorder to operate for 5 minutes after last engine shut-down or during manual operation up to 5 minutes after initially energizing aircraft electrical network.

H. Relay 24RK controlling intentional erasure of the magnetic tape when the aircraft is on the ground with parking brake applied.

I. Relay 25RK controlling the ground signal to time delay relay (23RK) and magnetic latch switch (51TU).




Cockpit Voice Recorder - Block Schematic
Figure 003




Cockpit Voice Recorder - Block Schematic
Figure 004

J. Magnetic Latch Switch (51TU) providing manual control of the cockpit voice recorder when aircraft is on the ground and indicates that recorder is operating with a blue ON light.

**ON A/C 004-200,

K. Audio Junction Box (18RK) that combines audio signals from the audio intercom unit and the DFDAU. The audio junction box is mounted on a plate on the LH side in the electronics compartment between FR16 and FR16A.

**ON A/C ALL

4. Component Description

A. Control Unit (1RK)

R (Ref. Fig. 005)

The control unit is attached to the overhead panel by means of four dzus fasteners located on the face. An electrical connector is provided at the back for interconnection with the cockpit voice recorder system. Located on the face is:

(1)A meter which monitors the recording level during the test sequence when the pointer should read between 8 and 10 on the meter scale for each channel being tested. During normal operation the pointer will move when any of the four channels is being recorded.

(2)A TEST P/BSW which is provided to verify the correct recording function of each channel in an automatic sequence from channel 1 to channel 4. The test gives a go no-go indication on the meter of the control unit.

(3)An ERASE P/BSW enabling the intentional bulk erasure of the magnetic tape.

(4)A HEADSET socket provided to allow audio monitoring of all four recorded channels simultaneously and to confirm that a tone is present during test sequence.

Inside the control unit (1RK) is a microphone pre-amplifier which is supplied with 18VDC from the cockpit voice recorder.

B. Recorder Unit (2RK)

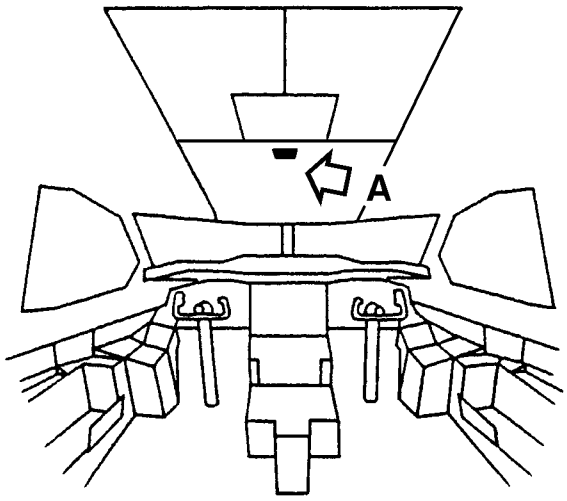
**ON A/C 001-005,

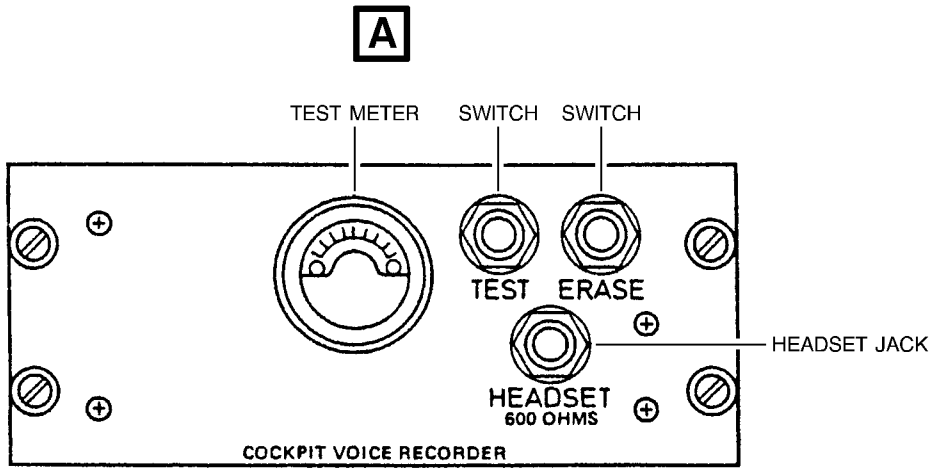
(Ref. Fig. 006)

**ON A/C 006-200,

(Ref. Fig. 007)

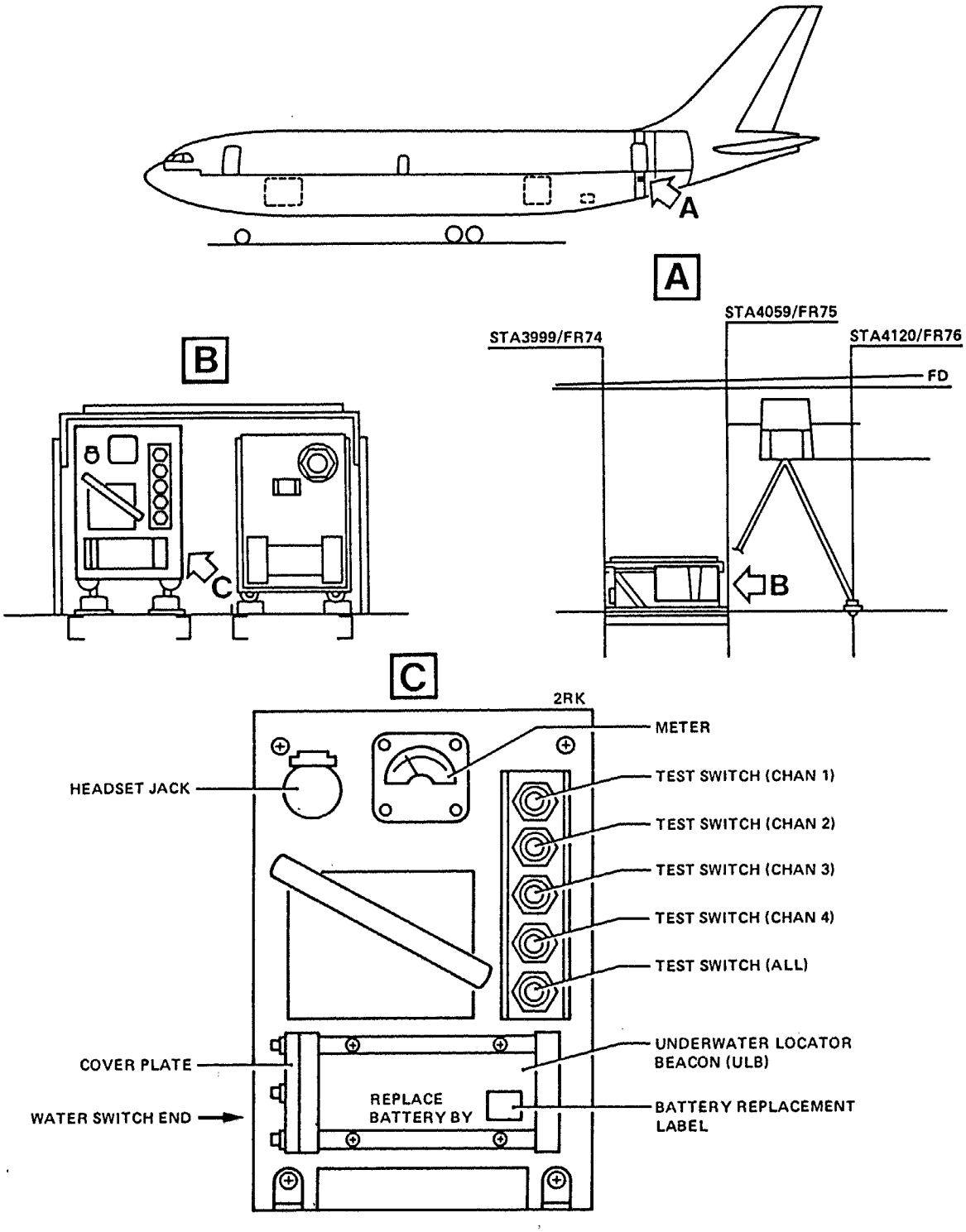
**ON A/C ALL



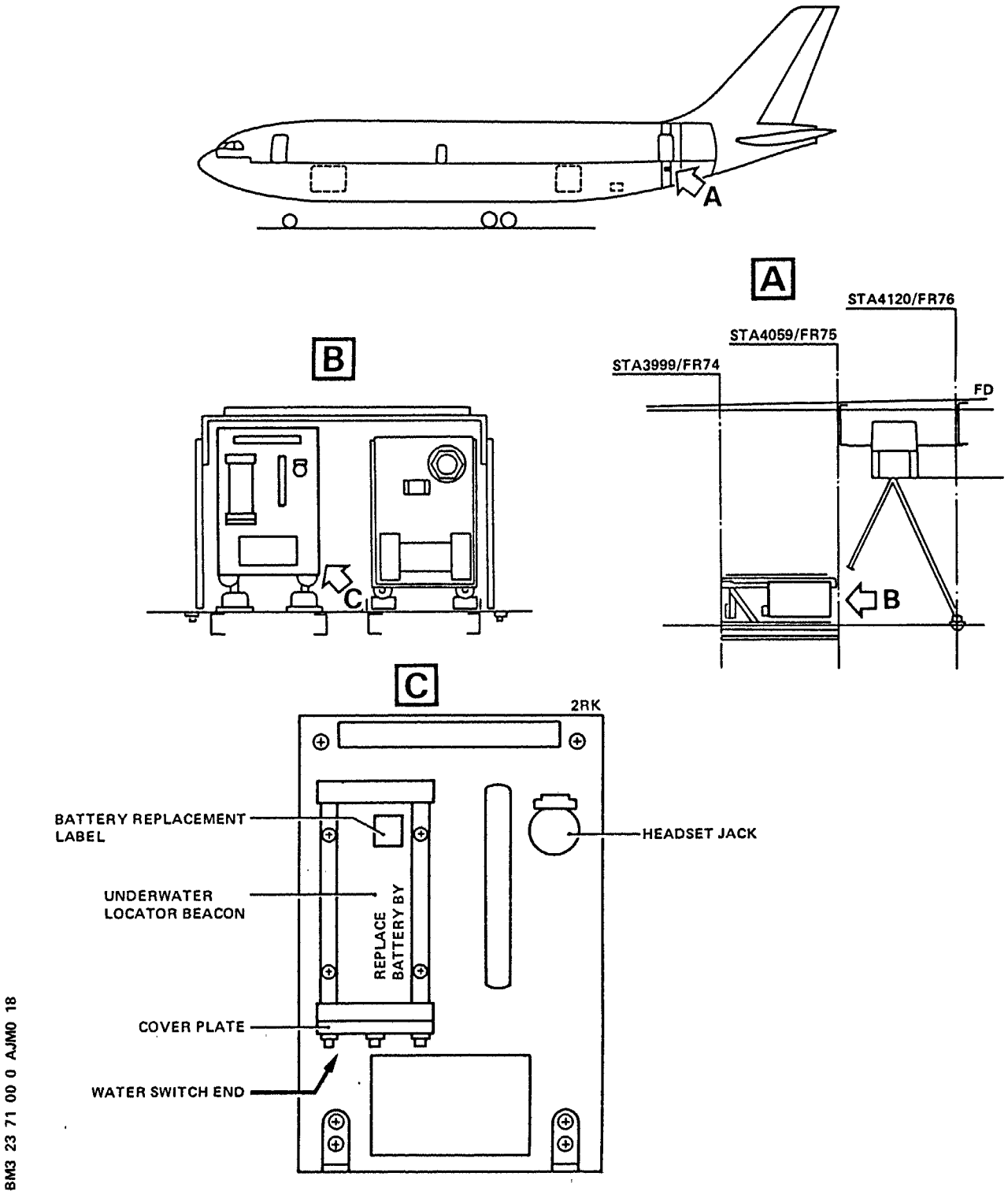




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R Cockpit Voice Recorder Control Unit (1RK)
Figure 005




Cockpit Voice Recorder (2RK)
Figure 006




Cockpit Voice Recorder (2RK)
Figure 007

The cockpit voice recorder (2RK) is located in the AFT section of the aircraft between FR74 and FR75. It is attached to a shock-resistant mounting by means of two locking tabs.
On the face:

(1) An underwater locater beacon (ULB) is mounted on a bracket attached to the recorder. The ULB is a battery-operated device which radiates a pulsed acoustic signal into the surrounding water upon activation of its water-sensitive switch. It consists of a self-contained battery, an electronic module and a transducer. The battery is shock-mounted and separated from the electronic module by a bulkhead built into the case; it is accessible by removal of the end cover which is sealed with an O-ring. Located on the opposite end of the ULB is a teflon-insulated water-sensitive switch.

**ON A/C 001-005,

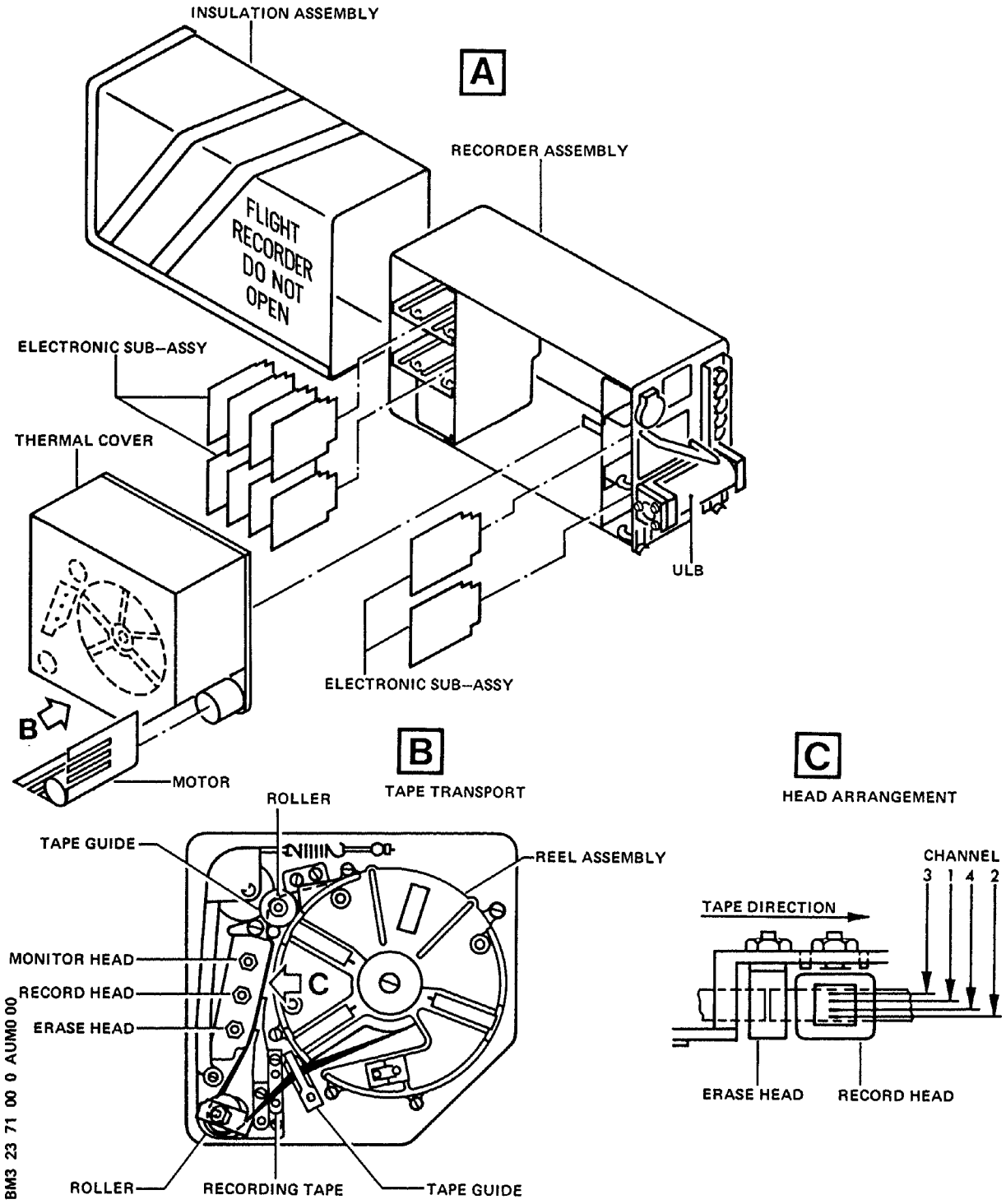
(Ref. Fig. 008)

R **ON A/C 006-200,

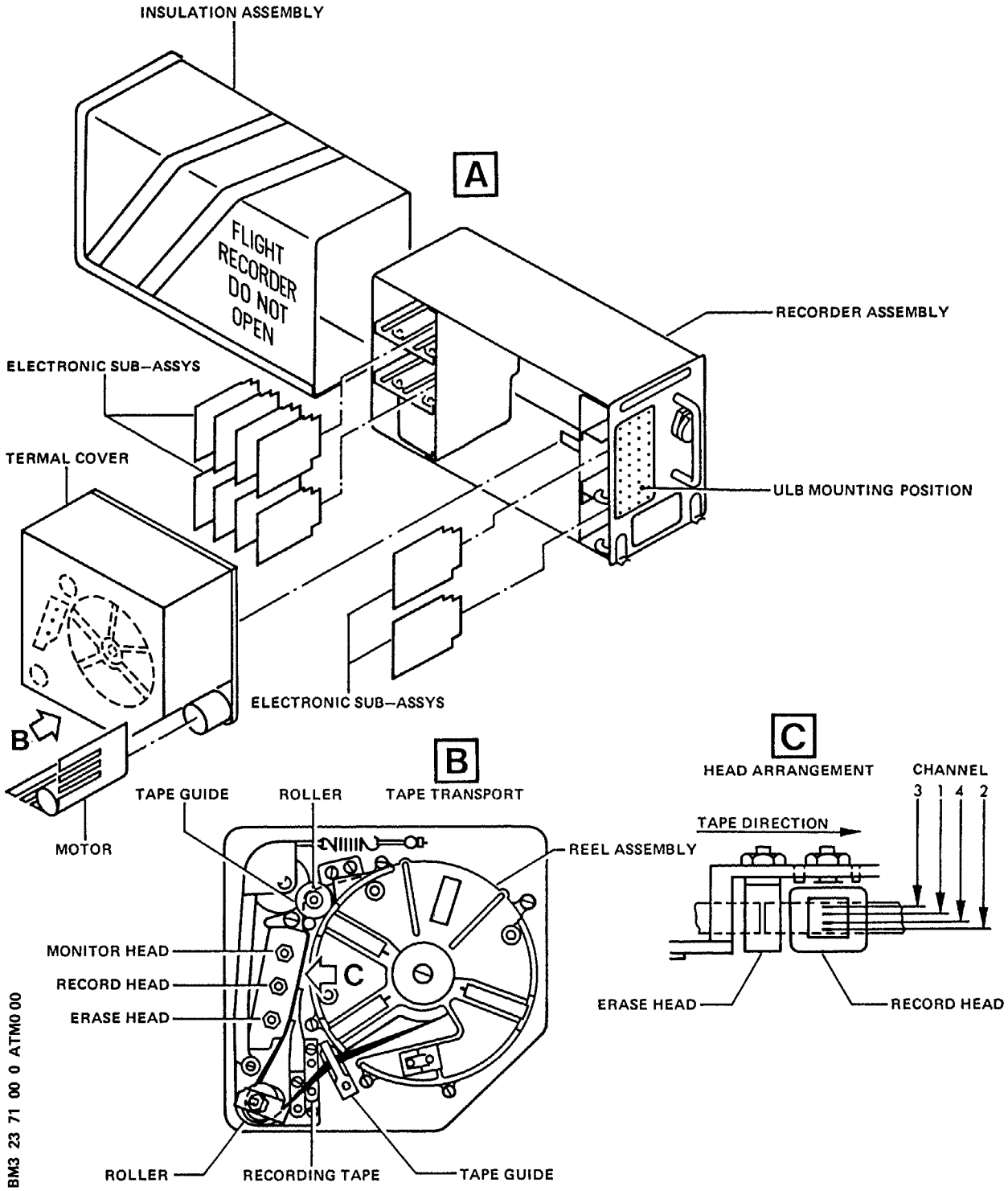
(Ref. Fig. 009)

**ON A/C 001-005,

(2) A socket is provided for the connection of a headset enabling the monitoring of all four recorded channels simultaneously.
(3) 5 P/BSWs, the first 4 of which enable individual channels to be tested and the 5th for testing each channel in an automatic sequence from channel 1 to channel 4.
(4) A meter which is connected in parallel with the meter located in control unit (1RK) and performs the same function as the control unit meter.
(5) Power supply which converts 115VAC at 400 Hz to separate outputs of 30VDC and 18VDC.
(6) The drive unit consists of a bridge assembly containing the record, monitor and erase heads, the capstan assembly which controls rate of movement of the tape and the chute assembly which introduces the tape back onto the reel and tape assembly.
(7) The reel and tape assembly consisting of an endless loop of magnetic tape 0.25 in. wide and 0.014 in. thick. The tape is oxide-coated on one side and graphite-lubricated on the other. 308 feet of tape are wound on the reel which is a single-sided plate with an inverted core, 1.975 in. wide at its largest dimension.
(8) Four one-stage recording amplifiers with record equalization and bias are fed from the Interphone Junction Box (1RN) (Ref. 23-51-00) via input transformers. The input transformers provide impedance matching and isolation for balanced or unbalanced grounded or ungrounded signals. The output of each amplifier is coupled to the output of a 65 KHz bias oscillator signal. The mixed audio and 65 KHz signals provide a combination bias voltage and record current which is applied directly to the appropriate channel on the recording head.




Cockpit Voice Recorder Sub-Assemblies
Figure 008




Cockpit Voice Recorder Sub-Assemblies
Figure 009

(9)The bias oscillator is a one-stage circuit which is coupled to the erase head and to the output of each of the four recording amplifiers.
(10)The audio frequency (AF) amplifier is fed by the tape monitor head, and amplifies simultaneously the recorded signals on all four channels. Output is fed to the headset sockets on the recorder face and control unit (1RK) and to the monitor amplifier, the output of which drives the meter on the face of control unit (1RK).
(11)The test circuit is activated when the TEST on control unit (1RK) is pressed. The circuit consists of an oscillator producing a 600 Hz signal and a switching circuit which switches the oscillator output to each of the channels on the recording head in a sequence from 1 to 4. The test gives a go no-go indication on the meters of the CVR and the control unit.
(12)The bulk erase timing assembly is activated when the ERASE P/BSW of control unit (1RK) is pressed for a minimum of 2 seconds. The timing assembly then energizes a relay whose normally open (NO) contacts close, energizing the bulk erase coil with 115VAC at 400 Hz.

R **ON A/C 006-200,

(2)A socket is provided for the connection of a headset enabling the monitoring of all four recorded channels simultaneously.
(3)Power supply which converts 115VAC at 400 Hz to separate outputs of 30VDC and 18VDC.
(4)The drive unit consists of a bridge assembly containing the record, monitor and erase heads, the capstan assembly which controls rate of movement of the tape and the chute assembly which introduces the tape back onto the reel and tape assembly.
(5)The reel and tape assembly consisting of an endless loop of magnetic tape 0.25 in. wide and 0.014 in. thick. The tape is oxide-coated on one side and graphite-lubricated on the other. 308 feet of tape are wound on the reel which is a single-sided plate with an inverted core, 1.975 in. wide at its largest dimension.
(6)Four one-stage recording amplifiers with record equalization and bias are fed from the Interphone Junction Box (1RN) (Ref. 23-51-00) via input transformers. The input transformers provide impedance matching and isolation for balanced or unbalanced grounded or ungrounded signals. The output of each amplifier is coupled to the output of a 65 KHz bias oscillator signal. The mixed audio and 65 KHz signals provide a combination bias voltage and record current which is applied directly to the appropriate channel on the recording head.
(7)The bias oscillator is a one-stage circuit which is coupled to the erase head and to the output of each of the four recording amplifiers.
(8)The audio frequency (AF) amplifier is fed by the tape monitor head, and amplifies simultaneously the recorded signals on all four channels. Output is fed to the headset sockets on the recorder face and control unit (1RK) and to the monitor amplifier, the output of which drives the meter on the face of control unit (1RK).
(9)The test circuit is activated when the TEST on control unit (1RK) is pressed. The circuit consists of an oscillator producing a 600 Hz signal and a switching circuit which switches the oscillator output to each of

the channels on the recording head in a sequence from 1 to 4. The test gives a go no-go indication on the meter of the control unit.

(10) The bulk erase timing assembly is activated when the ERASE P/BSW of control unit (1RK) is pressed for a minimum of 2 seconds. The timing assembly then energizes a relay whose normally open (NO) contacts close, energizing the bulk erase coil with 115VAC at 400 Hz.

**ON A/C ALL

C. Relay 6RK
(1) In FLIGHT configuration, a ground signal energizes relay 6RK which connects 115VAC at 400 Hz through its normally open contacts to the recorder unit (2RK).
(2) In GROUND configuration relay 6RK is normally de-energized, however it can be energized through the magnetic latch switch (51TU) for test facility and manual operation.

D. Relay 7RK is normally de-energized when both engines are running (low oil pressure indication OFF). Energizing of this relay is controlled by the time delay relay (23RK).

E. Time delay relay (23RK) is a relay which energizes after 5 minutes continuous application of a ground signal. Since the function of the time delay relay (23RK) controls relay 7RK, the power supply to the voice recorder will remain ON for 5 minutes after the second engine is shut down.

F. Relay 24RK is energized when the parking brake control handle is pulled up. Its normally open (NO) contacts are one of a series of contacts from various relays which control 30VDC applied to the Bulk Erase Timing Assembly via the ERASE switch on control unit (1RK).

G. Relay 25RK is energized when the aircraft is on the ground with engine 1 shut down (low oil pressure indication OFF). A ground signal is passed via its normally open (NO) contacts to the magnetic latch switch (51TU) when the aircraft is on the ground and engine 2 is shut down (low oil pressure indication OFF).

H. Magnetic Latch Switch (51TU) controls the manual function of the cockpit voice recorder system. The system can only be operated manually when the aircraft is on the ground and both engines are shut down (low oil pressure warnings ON). When the ON caption of the GND CTL switch/ indicator light is pressed, the ON caption comes on (blue) indicating that the switch is magnetically latched and the voice recorder is operating. The switch is automatically unlatched when one engine is started (low oil pressure warning light OFF) and the recorder continues to operate in the automatic mode. The switch also unlatches when the power supply is cut off. Manual unlatching takes place when the ON caption is pressed for the second time. In all cases the ON light goes off.
NOTE : There is no indication of cockpit voice recorder function when

operating in the automatic mode.

R **ON A/C 004-200,

I. The Audio Junction Box (18RK) contains three input circuits that can combine two different input impedances. On the two output channels the combined and amplified input signals are available with different impedances.

For the CVR the audio junction box sums two low-frequency audio input signals. One signal comes from the FLT ING output of the audio intercom unit and the other is a time signal from the DFDAU. The audio junction box sums the two inputs and sends the combination to the input channel 1 of the CVR.

**ON A/C ALL

5. Operation

**ON A/C 001-003,

(Ref. Fig. 010)

**ON A/C 004-005,

(Ref. Fig. 011)

R **ON A/C 006-200,

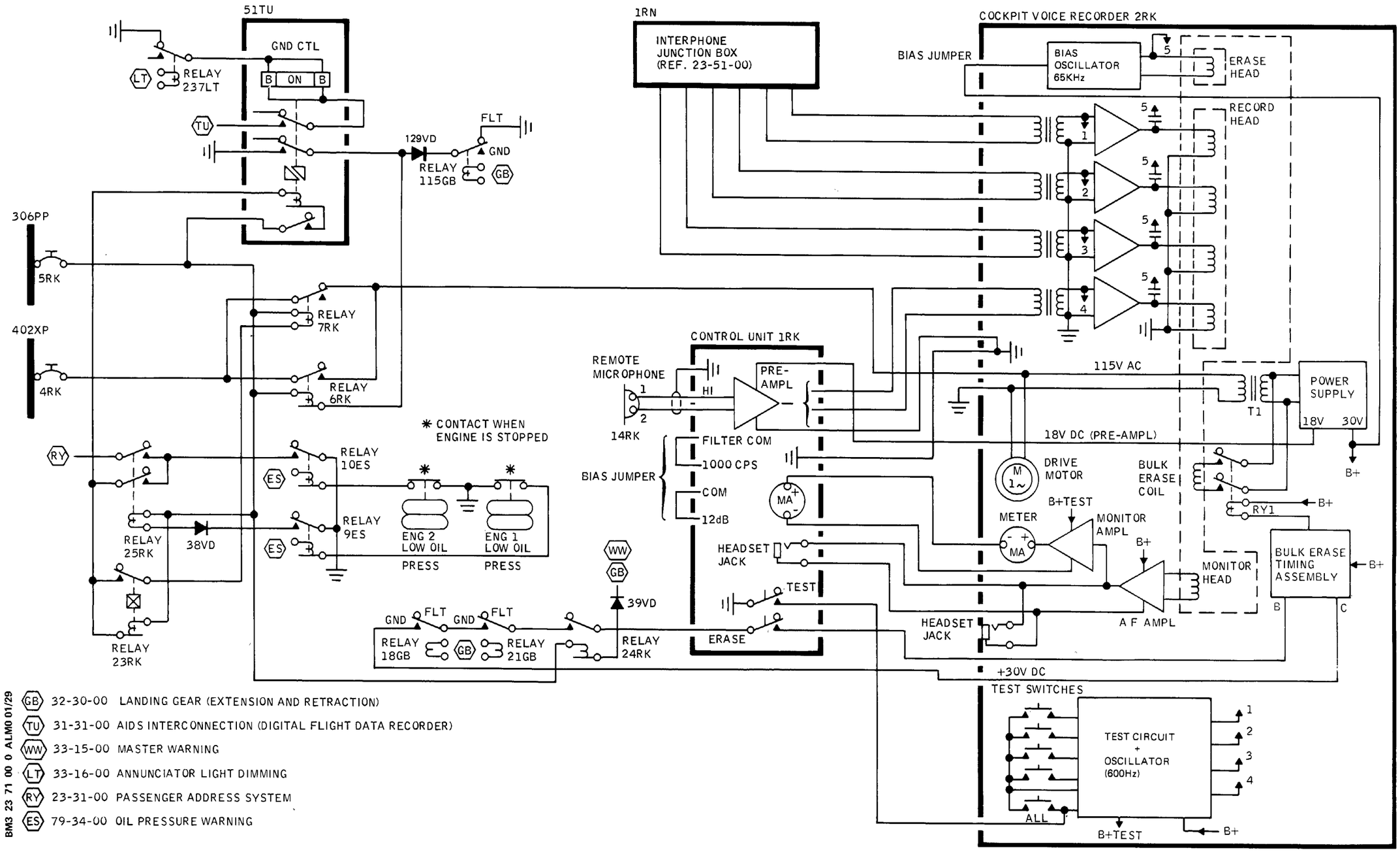
(Ref. Fig. 012)

**ON A/C ALL

A. Automatic Power Supply
The cockpit voice recorder is automatically supplied with 115VAC when the aircraft is in the following configurations:
- in flight with engines running or stopped
- on the ground with at least one engine running
- on the ground during the first five minutes of activation of aircraft electrical network
- on the ground up to five minutes after second engine shut down.

(1)Aircraft in flight - Landing gear relay 115GB is de-energized providing a ground signal via its normally closed (NC) contacts to relay 6RK. Relay 6RK is supplied directly with 28VDC from bus bar 306PP via circuit breaker 5RK. 115VAC at 400 Hz is fed to the voice recorder via the normally open (NO) contacts of relay 6RK from bus bar 402XP through circuit breaker 4RK. The normally closed (NC) contacts of relay 7RK provide a parallel path with the normally open (NO) contacts

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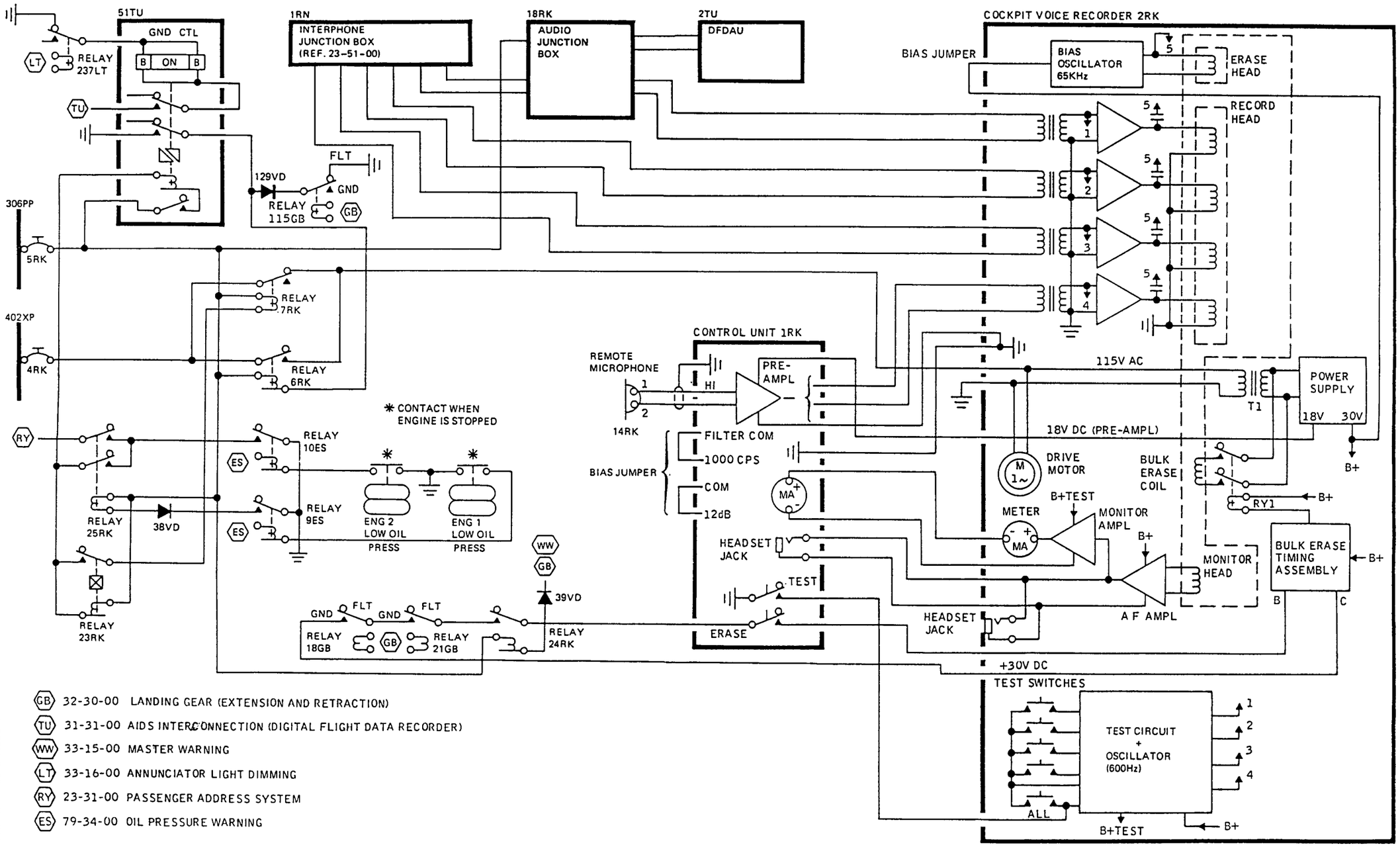

Cockpit Voice Recorder - Interconnection Schematic
Figure 010

R EFFECTIVITY: 001-003,

PIA



Printed in France




BMG 23 71 00 0 ALCO 01

Cockpit Voice Recorder - Interconnection Schematic
Figure 011

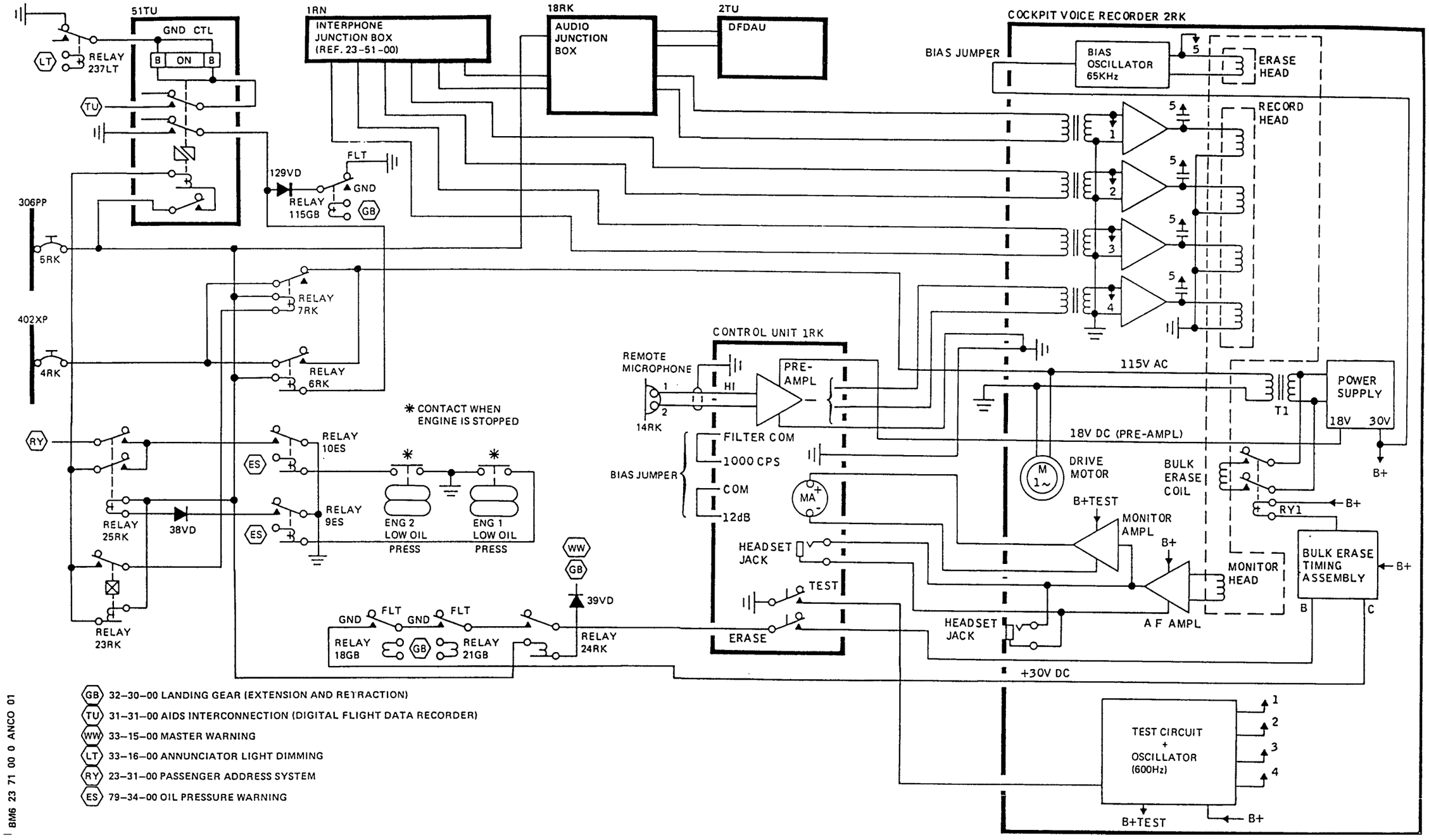
R

EFFECTIVITY: 004-005,

PIA



Printed in France




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Cockpit Voice Recorder - Interconnection Schematic
Figure 012

R

of relay 6RK for the supply of 115VAC at 400 Hz from bus bar 402XP via circuit breaker 4RK to the voice recorder.

(2)Aircraft on the ground with one or both engines running (low oil pressure) - Landing gear relay 115GB is energized and no ground signal is fed to relay 6RK which will remain de-energized. One or both low oil pressure switches will be open and therefore no ground signal is fed to relay 23RK. Since time delay relay (23RK) controls the energized or de-energized state of relay 7RK, relay 7RK will remain de-energized and 115VAC at 400 Hz will be connected from bus bar 402XP via circuit breaker 4RK through its normally closed (NC) contacts to the voice recorder.

(3)Aircraft on the ground during the first five minutes of activation of the aircraft electrical network - Both engine low oil pressure switches are closed. Relay 9ES is energized and a ground signal is passed via its normally open (NO) contacts to relay 25RK. Relay 25RK is fed from bus bar 306PP via circuit breaker 5RK with 28VDC and energizes. Relay 10ES is energized and a ground signal is passed via its normally open (NO) contacts through the normally open (NO) contacts of relay 25RK to the time delay relay (23RK), which will start its timing function. During this timing function relay 7RK remains de-energized and 115VAC at 400 Hz is supplied from bus bar 402XP via circuit breaker 4RK through the normally closed (NC) contacts of relay 7RK to the voice recorder.

NOTE : After 5 minutes a ground signal will be passed via the normally open (NO) contacts of time delay relay (23RK) to relay 7RK which will energize and cut off the supply of 115VAC at 400 Hz to the voice recorder. Landing gear relay 115GB is energized and no ground signal is fed to relay 6RK which will remain de-energized and recorder function will stop.

(4)Aircraft on the ground up to five minutes after second engine shut down oil pressure warning light ON) - Both engine low oil pressure switches are closed. Relay 9ES is energized and a ground signal is passed via its normally open (NO) contacts to relay 25RK. Relay 25RK is fed from bus bar 306PP via circuit breaker 5RK with 28VDC and energizes. Relay 10ES is energized and a ground signal is passed via its normally open (NO) contacts through the normally open (NO) contacts of relay 25RK to the time delay relay (23RK) which will start its timing function. During this timing function relay 7RK remains de-energized and 115VAC at 400 Hz is supplied from bus bar 402XP via circuit breaker 4RK through the normally closed (NC) contacts of relay 7RK to the voice recorder.

NOTE : After 5 minutes a ground signal will be passed via the normally open (NO) contacts of time delay relay (23RK) to relay 7RK which will energize and cut off the supply of 115VAC at 400 Hz to the voice recorder. Landing gear relay 115GB is energized and no ground signal is fed to relay 6RK which will remain de-energized and recorder function will stop.

B. Manual Power Supply

(1)Purpose

Manual selection of power supply to the cockpit voice recorder allows the following functions with the aircraft on the ground and both engines shut down:

- to test the voice recorder for correct operation

- to record the beginning of the check list before the first engine starts
- to carry out tape erasure if required.

(2)Operation

With both engines shut down (low oil pressure indicator lights ON), relay 9ES is energized by a ground signal from Engine 1 low oil pressue switch. Relay 25RK is energized by a ground signal fed from the normally open (NO) contact of relay 9ES. Relay 10ES is energized by a ground signal from the Engine 2 low oil pressure switch. A ground signal is fed to magnetic latch switch (51TU) through the normally open (NO) contact of relay 10ES via the normally open (NO) contacts of relay 25RK. By pressing the ON caption of the GND CTL indicator/switch 51TU the switch will remain magnetically latched ON and the blue ON caption will come ON. A ground signal is then fed from the normally open (NO) contact via terminal B3 of magnetic latch switch (51TU) to relay 6RK. 115VAC at 400 Hz is fed from bus bar 402XP via circuit breaker 4RK through the normally open (NO) contact of relay 6RK to the cockpit voice recorder. Magnetic latch switch (51TU) will remain magnetically latched provided that the supply of 28VDC from bus bar 306PP is not removed or both engines remain OFF. If any one of the two engines is started, the ground signal to the Magnetic Latch Switch 51TU will be removed and the switch will automatically unlatch removing the ground signal from the switch to relay 6RK which will de-energize and disconnect the 115VAC supply to the voice recorder.

C. Recording

The recording system consists of four identical recording channels. All channels are independent of each other and are separated at input by isolation transformers. Three channels allow the recording of signals from Third Crew Member's, First Officer's or Captain's audio selector panel respectively via the interphone junction box (1RN).
One channel allows the recording of the ambient noises picked up by the area microphone and fed via a pre-amplifier in control unit (1RK) to the input transformer.
Since the four channels are identical, only the operation of one channel is described.
The AF signal generated from one station is applied to the recorder amplifier. This signal is mixed with the 65 KHz signal from the bias generator and amplified to produce a combination bias voltage and record current which is applied directly to the record head which causes the channel signal to be recorded magnetically on one track of the magnetic tape. Each record head creates its own magnetic impression on the corresponding track.
The internal power supply provides +30VDC to control the relay and +18VDC to feed the area microphone pre-amplifier in the control unit (1RK).

D. Monitoring

Simultaneous monitoring of all 4 channels is possible by connecting a headset to the face of the recorder unit (2RK) or control unit (1RK), where jack-sockets are provided. The jack-sockets are connected in parallel and fed directly from the output of the AF amplifier. The

monitor head is a single full-width head and therefore only simultaneous monitoring of all 4 channels is possible. Its output is connected to the input of the AF amplifier. The output of the AF amplifier is also connected to the Monitor amplifier which drives a meter located on the face of control unit (1RK).
The meter constantly indicates the recorded level of all channels during normal operation and each individual channel during test sequence.

E. Testing in Cockpit
When the TEST P/BSW on the face of control unit (1RK) is pressed, a 600 Hz test tone is applied to each of the 4 record amplifiers alternately for approx. 0.8 seconds. The record amplifiers mix the test tone with the audio input and transmits the combined audio to the recording head for impression on the magnetic tape. The monitor head subsequently detects the tone and applies it to the monitor amplifier. The tone is amplified to the HEADSET socket for aural indication and to the test meter via the monitor amplifier for a visual GO, NO-GO indication.

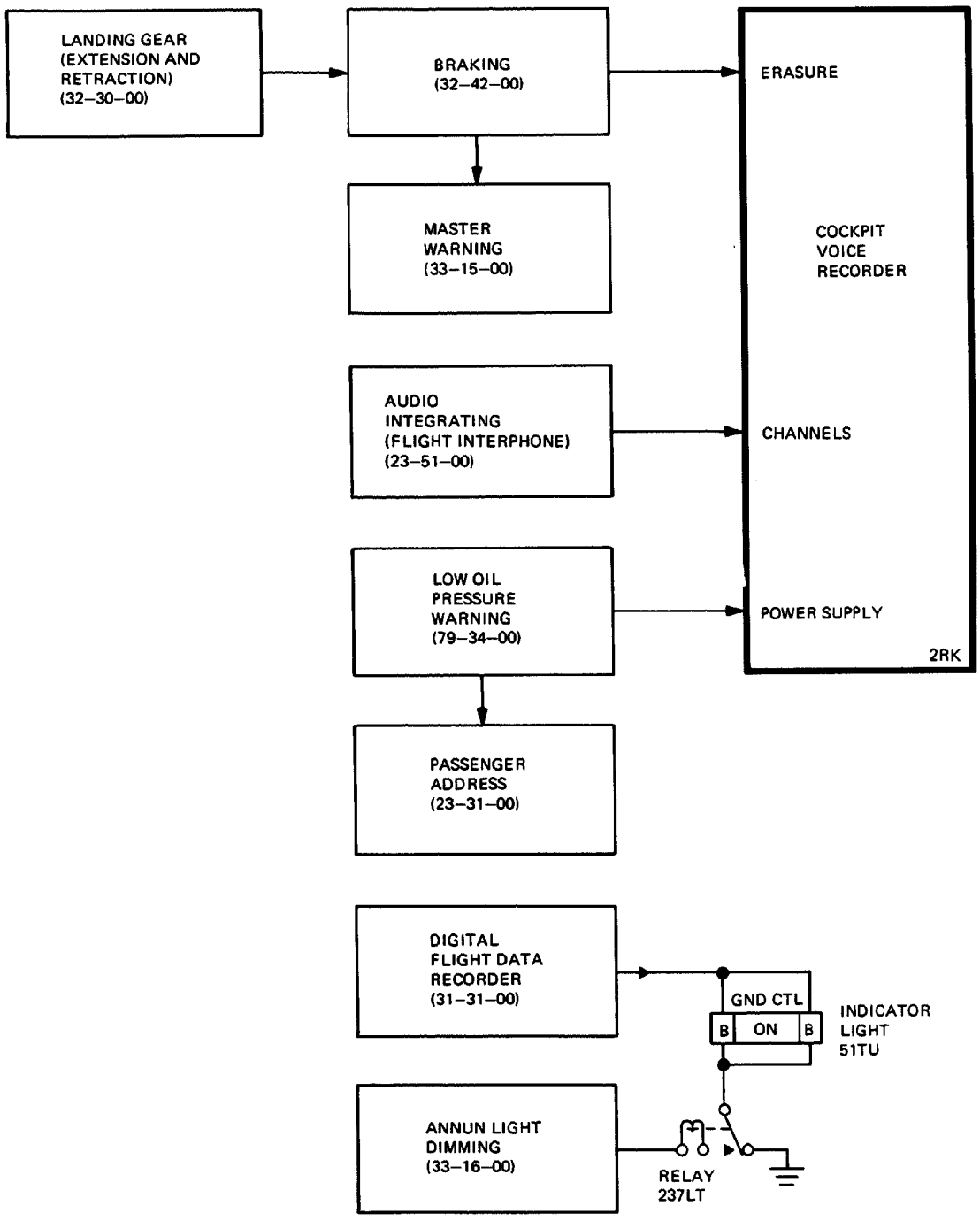
F. Erase
(1)Bulk erasure
The bulk erase sequence is initiated from the control unit (1RK) ERASE P/BSW. To prevent accidental erasure, the P/BSW must be pressed for at least two seconds and the landing gear must be down with the aircraft weight on and parking brake handle pulled.
NOTE : The cockpit voice recorder is energized for 5 minutes after the second engine is shut down (low oil pressure warning light ON).
A +30VDC signal (erase charge signal), generated by the bulk erase timing assembly, is applied to the coil of relay RY1 through:
- the normally open (NO) contacts of RH gear shock absorber relay 18GB
- the normally open (NO) contacts of LH gear shock absorber relay 21GB
- the normally open (NO) contacts of relay 24RK, this relay being energized when parking brake control handle is pulled-up and locked
- the normally open (NO) contacts of the ERASE P/BSW.

The normally open (NO) contacts of relay RY1 allows 115VAC at 400 Hz to be applied to the bulk erase coil which generates a magnetic field for erasure of the complete tape.
NOTE : The timing circuit in the cockpit voice recorder activates the relay RY1 for 5 seconds (minimum). This ensures that the complete tape is erased.

(2)Automatic erasure
The erase head is permanently activated by a 65 kHz signal generated.

6. Interfaces
(Ref. Fig. 013)
The cockpit voice recorder is interconnected with the following systems:

A. The Low Oil Pressure Warning System
A pressure switch on each engine transmits a ground signal (engine shut down) which controls relay 25RK and time delay Relay (23RK).




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Cockpit Voice Recorder - Interfaces
Figure 013

B. The Audio Integrating System (Flight Interphone)
This system connects information from Captains, First Officer's and Third Crew Members audio selector panels to the voice recorder.

C. The Parking Brake
When the parking brake control handle is pulled up and locked, a ground signal energizes relay 24RK. Should the recorder be energized and the ERASE P/BSW on control unit (1RK) pressed, the bulk erase coil is also energized and erases the complete tape.

D. The Landing Gear
With the aircraft on the ground, main gear shock absorber relays 18GB and 21GB are energized. This is a pre-condition of bulk erasure. The bulk erasure is completed when parking brake control handle is pulled up and locked and the ERASE P/BSW on control unit (1RK) is pressed.

E. The Master Warning System
When the parking brake control handle is pulled up and locked, a ground signal is sent to the master warning light system.

F. The Passenger Address System
With both engines shut down (low oil pressure warning lights ON) a ground signal is sent from Engine 2 low oil pressure switch via the normally open (NO) contacts of relays 10ES and 25RK to the passenger address system.

G. The Flight Data Recorder
The GND CTL indicator light marked ON (blue) is energized with 28VDC from the digital flight data recorder system.

H. The Annunciator Light Dimming System
The GND CTL indicator light marked ON (blue) comes on brightly when relay 237LT is de-energized. The normally open (NO) contact connects the indicator light directly to ground potential. When annunciator lights are dimmed, relay 237LT is energized and introduces a variable impedance path to ground via the light dimming system.

1. Operational Test

A. Operational Test of CVR by Depressing TEST Pushbutton
(1)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Headset (600 ohms) |

Referenced Procedures
- 23-50-00, P. Block 501 Audio Integrating
- 24-41-00, P. Block 301 AC External Power Control

(2)Job Set-Up
(a)Make certain that the aircraft is in GROUND configuration.
(b)Make certain that neither of the main engines are running.
(c)Pull up and lock parking brake control handle.
(d)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(e)Energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
(f)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | RCDR-CVR SUPPLY | 4RK | 204/F28 |
| 22VU | RCDR-CTL | 5RK | 204/F27 |
| 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS2 FLT/GND | 1GB | 331/V52 |
| 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS1 RELAYS AND RETRACT CTL | 2GB | 332/U51 |
| 22VU | AUDIO SYS - CTL PNL CAPT | 30RN | 205/E19 |
| 22VU | AUDIO SYS - CTL PNL F/O | 31RN | 205/E20 |
| 22VU | AUDIO SYS - CTL PNL THIRD OCCUPANT | 32RN | 205/E18 |

(g)Connect headset (600 ohms) to control unit 1RK at overhead panel.
(3)Operational (BITE) Test at Control Unit 1RK.

R NOTE : The cockpit voice recorder is automatically energized whenever
R the aircraft electrical network is initially energized.
R The recorder is automatically de-energized 5 minutes after
R the last engine shut down, or when the aircraft weight is
R off undercarriage, or when the GND CTL pushbutton switch on
R the overhead panel 442VU goes OFF.

| ACTION | RESULT |
|---|---|
| 1. On overhead panel 442VU<br>- press GND CTL P/BSW/Indicator light (ON) | On overhead panel 442VU<br>- Magnetic Latch Switch (51TU) is latched on and ON indicator light comes on (blue) |

| ACTION | RESULT |
|---|---|
| 2. On control unit 1RK<br>- hold TEST P/BSW at least for 5 seconds pressed. | After a short delay, ascertain that a 600 Hz tone is present and observe that the meter neddle indicates in the green area.<br><br>NOTE : Fluctuation out of the green area indicates a defective channel. |
| 3. On control unit 1RK<br>- release TEST P/BSW. | The pointer on control unit meter ceases to deflect and 600 Hz tone is no longer audible. |
| 4. At overhead panel 442VU<br>- press GND CTL P/BSW/Indicator light (ON) | At overhead panel 442VU<br>- Magnetic Latch Switch (51TU) is unlatched and ON indicator light goes off |

(4)Close-Up
(a)Disconnect headset from control unit.
(b)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
(c)De-energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
(d)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

C.Operational Test to confirm Availability and Aural Quality of all Active CVR Channels
(1)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Headset (600 ohms) |

Referenced Procedures

| | |
|---|---|
| - 23-50-00, P. Block 501 | Audio Integrating |
| - 24-41-00, P. Block 301 | AC External Power Control |

(2)Job Set-Up
(a)Make certain that the aircraft is in GROUND configuration.
(b)Make certain that neither of the main engines are running.
(c)Pull up and lock parking brake control handle.
(d)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(e)Energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
(f)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | RCDR-CVR SUPPLY | 4RK | 204/F28 |
| 22VU | RCDR-CTL | 5RK | 204/F27 |
| 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS2 FLT/GND | 1GB | 331/V52 |
| 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS1 RELAYS AND RETRACT CTL | 2GB | 332/U51 |
| 22VU | AUDIO SYS - CTL PNL CAPT | 30RN | 205/E19 |
| 22VU | AUDIO SYS - CTL PNL F/O | 31RN | 205/E20 |
| 22VU | AUDIO SYS - CTL PNL THIRD OCCUPANT | 32RN | 205/E18 |

(g)Connect headset (600 ohms) to control unit 1RK at overhead panel.

(3)Operational Test of all active CVR Channels

R NOTE : The cockpit voice recorder is automatically energized whenever
R the aircraft electrical network is initially energized.
R The recorder is automatically de-energized 5 minutes after
R the last engine shut down, or when the aircraft weight is
R off undercarriage, or when the GND CTL pushbutton switch
R on the overhead panel 442VU goes OFF.

R

R

| ACTION | RESULT |
|---|---|
| 1. At overhead panel 442VU<br>- press GND CTL P/BSW/Indicator light (ON) | At overhead panel 442VU<br>- Magnetic Latch Switch (51TU) is latched on and ON Indicator light comes on (blue) |
| 2. Speak in a normal voice in flight compartment at least 4 feet from the area microphone | After approximately 2 seconds recorded speech is audible and clear in headset |
| 3. Cover area microphone to prevent sound being picked up and recorded on channel 4 | |
| 4. At Captains Audio Selector Panel,<br>- select INTER and speak into Captains Hand Microphone<br>- deselect INTER after completion of test | After approximately 2 seconds recorded speech is audible and clear in headset |
| 5. Repeat steps 3 and 4 for F/O Station and 3rd Occupant station | |
| 6. At overhead panel 442VU<br>- press GND CTL P/BSW/Indicator light again | At overhead panel 442VU<br>- Magnetic Latch Switch (51TU) unlatches, GND CTL indicator light (ON) goes off and recorder unit (2RK) is de-energized (Provided neither engine is running) |

R (4)Close-Up
R (a)Disconnect headset from control unit.
R (b)Make certain that work area is clean and clear of tools and
R miscellaneous items of equipment.
R (c)De-energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
R (d)De-energize the aircraft electrical network and disconnect electrical
R ground power unit (Ref. 24-41-00, P. Block 301).

R D. Operational Test of Time Delay Relay
R (1)Equipment and Materials

| R ITEM | DESIGNATION |
|---|---|
| R (a) | Headset (600 ohms) |

R Referenced Procedures

- 23-50-00, P. Block 501 Audio Integrating
- 24-41-00, P. Block 301 AC External Power Control

(2)Job Set-Up
(a)Make certain that the aircraft is in **GROUND** configuration.
(b)Make certain that neither of the main engines are running.
(c)Pull up and lock parking brake control handle.
(d)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(e)Energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
(f)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | RCDR-CVR SUPPLY | 4RK | 204/F28 |
| 22VU | RCDR-CTL | 5RK | 204/F27 |
| 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS2 FLT/GND | 1GB | 331/V52 |
| 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS1 RELAYS AND RETRACT CTL | 2GB | 332/U51 |
| 22VU | AUDIO SYS - CTL PNL CAPT | 30RN | 205/E19 |
| 22VU | AUDIO SYS - CTL PNL F/O | 31RN | 205/E20 |
| 22VU | AUDIO SYS - CTL PNL THIRD OCCUPANT | 32RN | 205/E18 |

(g)Connect headset (600 ohms) to control unit 1RK at overhead panel.

R (3)Test
R NOTE : The cockpit voice recorder is automatically energized whenever
R the aircraft electrical network is initially energized.
R The recorder is automatically de-energized 5 minutes after
R the last engine shut down, or when the aircraft weight is
R off undercarriage, or when the **GND CTL** pushbutton switch
R on the overhead panel 442VU goes **OFF**.

(a)Check of 5-minute time-delay relay

| ACTION | RESULT |
|---|---|
| 1. On circuit breaker panel 22VU<br>- open circuit breaker 5RK<br>- close circuit breaker 5RK and note time simultaneously. | |
| 2. On VHF1 control unit<br>- select **ATIS** frequency. | |
| 3. On **CAPT** audio control panel<br>- push then release **VHF1** reception pushbutton switch and adjust reception level | You can hear the audio signal in the headset for 5 minutes.<br>Then the audio signal stops (muted). |
| 4. On control unit 1RK | |

| ACTION | RESULT |
|---|---|
| - hold TEST pushbutton switch at least for 5 seconds pressed | You cannot hear the test tone(s) and the pointer (or needle) on control unit meter does not deflect. |

5. On control unit 1RK
   - release TEST pushbutton switch.

6. On VHF1 control unit
   - deselect ATIS frequency.

7. On CAPT audio control panel
   - push back pushbutton switch to its original position.

(4)Close-Up
(a)Disconnect headset from control unit.
(b)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
(c)De-energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
(d)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

R E. Operational Test of Bulk Erase Function of CVR and Bulk Erase Inhibition Logic
R
R WARNING : MAKE SURE THAT ALL CIRCUITS IN MAINTENANCE ARE ISOLATED BEFORE YOU SUPPLY ELECTRICAL POWER TO AIRCRAFT.
R
R NOTE : This procedure is applicable on Cockpit Voice Recorder (CVR) and Solid State Cockpit Voice Recorder (SSCVR).
R
R (1)Reason for the Job
R Bulk Erase Test makes sure that voice recorder will erase only when aircraft is on ground with parking brake set.
R
R (2)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Headset (600 ohms) |

R Referenced Procedures
R - 24-41-00, P. Block 301 — AC External Power Control
R
R (3)Job Set-up
R (a)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that engines are stopped since at least five minutes.
(c)On CVR control unit 1RK, connect 600 ohms headset to HEADSET connector.
(d)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | RCDR-CVR SUPPLY | 4RK | 204/F28 |
| 22VU | RCDR-CTL | 5RK | 204/F27 |
| 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS2 FLT/GND | 1GB | 331/V52 |
| 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS1 RELAYS AND RETRACT CTL | 2GB | 332/U51 |

(4)Procedure
(a)Functional test with parking brake locked and aircraft in ground configuration
1 Aircraft maintenance configuration
a On mechanical center pedestal 9VU, make certain that parking brake control handle is in ON (applied) position.
b Make certain that aircraft is in ground configuration (landing gear compressed).
2 Test

| ACTION | RESULT |
|---|---|
| 1. On FLT RCDR panel 442VU:<br>- Push GND CTL pushbutton switch. | - On pushbutton switch, ON legend comes on.<br>In headset:<br>- Make sure that you can hear conversations from CVR microphone. |
| 2. On CVR control unit 1RK:<br>- Push ERASE pushbutton switch for not less than 2 seconds and release it. | In headset:<br>- Make sure that you can hear 400Hz tone signal. |
| 3. After 10 seconds:<br>- | - Make sure that you can only hear conversations from CVR microphone. |

(b)Functional test with parking brake unlocked and aircraft in ground configuration
1 Aircraft maintenance configuration
a On mechanical center pedestal 9VU, make certain that parking brake control handle is in OFF position.
b Make certain that aircraft is in ground configuration (landing gear compressed).
2 Test

| ACTION | RESULT |
|---|---|
| 1. On CVR control unit 1RK:<br>- Push ERASE pushbutton switch for not less than 2 seconds and release it. | In headset:<br>- Make sure that you cannot hear 400Hz tone signal. |

(c)Functional test with parking brake locked and aircraft in flight configuration
1 Aircraft maintenance configuration
a On mechanical center pedestal 9VU, make certain that parking brake control handle is in ON (applied) position.
b Put aircraft in flight configuration.
2 Test

| ACTION | RESULT |
|---|---|
| 1. On CVR control unit 1RK:<br>- Push ERASE pushbutton switch for not less than 2 seconds and release it. | In headset:<br>- Make sure that you cannot hear 400Hz tone signal. |

(5)Close-up
(a)Disconnect 600 ohms headset from HEADSET connector, on CVR control unit 1RK.
(b)Put aircraft in ground configuration.
(c)De-energize the aircraft electrical circuits (Ref. 24-41-00, P. Block 301).

2. Functional Test

A. Functional Test of Manual Erasure

(1)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Headset (600 ohms) |

| Referenced Procedures | |
|---|---|
| - 23-50-00, P. Block 1 | Audio Integrating |
| - 24-41-00, P. Block 301 | AC External Power Control |

(2)Job Set-Up
(a)Make certain that the aircraft is in GROUND configuration.
(b)Make certain that neither of the main engines are running.
(c)Pull up and lock parking brake control handle.
(d)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(e)Energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
(f)Connect headset (600 ohms) to control unit 1RK at overhead panel.
(g)Make certain that the following circuit breakers are closed:

| | PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|---|
| | 22VU | RCDR-CVR SUPPLY | 4RK | 204/F28 |
| | 22VU | RCDR-CTL | 5RK | 204/F27 |
| R | 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS 2 FLT/GND | 1GB | 331/V52 |
| R | 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS 1 RELAYS AND RETRACT CTL | 2GB | 332/U51 |
| | 22VU | AUDIO SYS - CTL PNL CAPT | 30RN | 205/E19 |
| | 22VU | AUDIO SYS - CTL PNL F/O | 31RN | 205/E20 |
| | 22VU | AUDIO SYS - CTL PNL THIRD OCCUPANT | 32RN | 205/E18 |
| R | 133VU | ENG 1 OIL LO PRESS | 1ES | 336/Q69 |
| R | 133VU | ENG 2 OIL LO PRESS | 2ES | 336/Q72 |

**ON A/C 001-005,

(3)Test
(a)BITE Test

| ACTION | RESULT |
|---|---|
| 1. At overhead panel 442VU<br>- press GND CTL P/BSW/Indicator light (ON) | At overhead panel 442VU<br>- Magnetic Latch Switch (51TU) is latched on and ON indicator light comes on (blue) |
| 2. On control unit 1RK<br>- hold TEST P/BSW at least for 5 seconds pressed. | After a short delay, ascertain that a 600 Hz tone is present and observe that the meter neddle indicates in the green area.<br><br>NOTE : Fluctuation out of the green area indicates a defective channel. |
| 3. On control unit 1RK<br>- release TEST P/BSW. | The pointer on control unit meter ceases to deflect and 600 Hz tone is no longer audible. |
| 4. At overhead panel 442VU<br>- press GND CTL P/BSW/Indicator light (ON) | At overhead panel 442VU<br>- Magnetic Latch Switch (51TU) is unlatched and ON indicator light goes off |

NOTE : For fault reporting purposes it is possible to ascertain which channel or channels have failed the above BITE Test by carrying out

the following procedure:

| ACTION | RESULT |
|---|---|
| 1. At recorder unit (2RK)<br>- press P/BSW 1 (top) and hold. (Channel 1) | At recorder unit (2RK)<br>- after approximately 2 seconds a 600 Hz continuous tone is audible in headset and meter pointer is in green sector. |
| 2. At recorder unit (2RK)<br>- release P/BSW 1 | At recorder unit (2RK)<br>- after approximately 2 seconds meter pointer is no longer deflected into white sector and 600 Hz tone ceases |
| 3. Repeat steps 1 and 2 for channels 2 to 4 | |

(b)Test of manual erasure.

| ACTION | RESULT |
|---|---|
| 1. At overhead panel 442VU<br>- press GND CTL P/BSW/Indicator light (ON) | At overhead panel 442VU<br>- Magnetic Latch Switch (51TU) is latched on and ON Indicator light comes on (blue) |
| 2. On control unit (1RK)<br>- press ERASE P/BSW for at least 2 seconds | After a further 5 seconds all recorded information is erased and nothing is audible in headset |
| 3. At overhead panel 442VU<br>- press GND CTL P/BSW/Indicator light (ON). | At overhead panel 442VU<br>- Magnetic Latch Switch (51TU) is unlatched and ON indicator light goes off |

**ON A/C 006-200,

(3)Test
(a)BITE Test

| ACTION | RESULT |
|---|---|
| R 1. On overhead panel 442VU<br>R - press GND CTL pushbutton switch (ON) | On overhead panel 442VU<br>- magnetic latch switch (51TU) is latched on and ON legend of GND CTL pushbutton switch comes on (blue). |
| 2. On control unit 1RK<br>R - hold TEST pushbutton switch at | After a short delay, make certain that a 600 Hz tone is present and |

| ACTION | RESULT |
|---|---|
| least for 5 seconds pressed | observe that the meter neddle indicates in the green area.<br><br>NOTE : Fluctuation out of the green area indicates a defective channel. |
| 3. On control unit 1RK<br>- release TEST pushbutton switch | The pointer on control unit meter ceases to deflect and 600 Hz tone is no longer audible. |
| 4. On overhead panel 442VU<br>- press GND CTL pushbutton switch (ON) | On overhead panel 442VU<br>- magnetic latch switch (51TU) is unlatched and ON legend of GND CTL pushbutton switch goes off. |

(b)Test of manual erasure

| ACTION | RESULT |
|---|---|
| 1. On overhead panel 442VU<br>- press GND CTL pushbutton switch (ON) | On overhead panel 442VU<br>- magnetic latch switch (51TU) is latched on and ON legend of GND CTL pushbutton switch comes on (blue). |
| 2. On control unit (1RK)<br>- press ERASE pushbutton switch for at least 2 seconds | After a further 5 seconds all recorded information is erased and nothing is audible in headset. |
| 3. On overhead panel 442VU<br>- press GND CTL pushbutton switch (ON) | On overhead panel 442VU<br>- magnetic latch switch (51TU) is unlatched and ON legend of GND CTL pushbutton switch goes off. |

**ON A/C ALL

(4)Close-Up
(a)Remove headset (600 ohms) from control unit 1RK on overhead panel.
(b)De-energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
(c)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(d)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.

B.Functional Test of Voice Recorder for proper 4 - Channel Operation.

(1)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Headset (600 ohms) |

Referenced Procedures
- 23-50-00, P. Block 1 — Audio Integrating
- 24-41-00, P. Block 301 — AC External Power Control

(2)Job Set-Up
(a)Make certain that the aircraft is in **GROUND** configuration.
(b)Make certain that neither of the main engines are running.
(c)Pull up and lock parking brake control handle.
(d)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(e)Energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
(f)Connect headset (600 ohms) to control unit 1RK at overhead panel.
(g)Make certain that the following circuit breakers are closed:

| | PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|---|
| | 22VU | RCDR-CVR SUPPLY | 4RK | 204/F28 |
| | 22VU | RCDR-CTL | 5RK | 204/F27 |
| R | 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS 2 FLT/GND | 1GB | 331/V52 |
| R | 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS 1 RELAYS AND RETRACT CTL | 2GB | 332/U51 |
| | 22VU | AUDIO SYS - CTL PNL CAPT | 30RN | 205/E19 |
| | 22VU | AUDIO SYS - CTL PNL F/O | 31RN | 205/E20 |
| | 22VU | AUDIO SYS - CTL PNL THIRD OCCUPANT | 32RN | 205/E18 |
| R | 133VU | ENG 1 OIL LO PRESS | 1ES | 336/Q69 |
| R | 133VU | ENG 2 OIL LO PRESS | 2ES | 336/Q72 |

(3)Test

| ACTION | RESULT |
|---|---|
| 1. At overhead panel 442VU<br>- press **GND CTL P/BSW**/Indicator light **(ON)** | At overhead panel 442VU<br>- Magnetic Latch Switch (51TU) is latched on and **ON** Indicator light comes on (blue) |
| 2. Speak in a normal voice in flight compartment at least 4 feet from the area microphone | After approximately 2 seconds recorded speech is audible and clear in headset |
| 3. Cover area microphone to prevent sound being picked up and recorded on channel 4 | |

| ACTION | RESULT |
|---|---|
| 4. At Captains Audio Selector Panel,<br>- select INTER and speak into Captains Hand Microphone<br>- deselect INTER after completion of test | After approximately 2 seconds recorded speech is audible and clear in headset |
| 5. Repeat steps 3 and 4 for F/O Station and 3rd Occupant station | |
| 6. At overhead panel 442VU<br>- press GND CTL P/BSW/Indicator light again | At overhead panel 442VU<br>- Magnetic Latch Switch (51TU) unlatches, GND CTL indicator light (ON) goes off and Recorder 2RK is de-energized (Provided neither engine is running). |

(4)Close-Up
(a)Remove headset (600 ohms) from control unit 1RK on overhead panel.
(b)De-energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
(c)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(d)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.

C. Functional Test of the Energizing/De-energizing Function

(1)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Access platform 3.7 m (12 ft.) |
| (b) | Headset (600 ohms) |
| Referenced Procedures | |
| - 23-50-00, P. Block 1 | Audio Integrating |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 52-30-00, P. Block 1 | BULK Cargo Compartment Door |

(2)Job Set-Up
(a)Make certain that the aircraft is in GROUND configuration.
(b)Make certain that neither of the main engines are running.
(c)Pull up and lock parking brake control handle.
R (d)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
R (e)Energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
R (f)Connect headset (600 ohms) to control unit 1RK at overhead panel.
R (g)Make certain that the following circuit breakers are closed:

| | PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|---|
| | 22VU | RCDR-CVR SUPPLY | 4RK | 204/F28 |
| | 22VU | RCDR-CTL | 5RK | 204/F27 |
| R | 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS 2 FLT/GND | 1GB | 331/V52 |
| R | 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS 1 RELAYS AND RETRACT CTL | 2GB | 332/U51 |
| | 22VU | AUDIO SYS - CTL PNL CAPT | 30RN | 205/E19 |
| | 22VU | AUDIO SYS - CTL PNL F/O | 31RN | 205/E20 |
| | 22VU | AUDIO SYS - CTL PNL THIRD OCCUPANT | 32RN | 205/E18 |
| R | 133VU | ENG 1 OIL LO PRESS | 1ES | 336/Q69 |
| R | 133VU | ENG 2 OIL LO PRESS | 2ES | 336/Q72 |

(3)Test

| ACTION | RESULT |
|---|---|
| 1. At circuit breaker panel 133VU<br>- open circuit breaker 2GB.<br>(Simulating flight condition) | Voice recorder is running (perform BITE Test to verify) |
| 2. At circuit breaker panel 133VU<br>- close circuit breaker 2GB | Voice recorder stops |
| 3. At circuit breaker panel 133VU<br>- open circuit breaker 1ES<br>(Simulating ENG1 running) | Voice recorder is running (perform BITE Test to verify). |
| 4. At circuit breaker panel 133VU<br>- close circuit breaker 1ES and note time | Voice recorder stops running after 5 minute time delay (CVR fails BITE Test to verify) |
| 5. At circuit breaker panel 133VU<br>- open circuit breaker 2ES<br>(Simulating ENG2 running) | Voice recorder is running (perform BITE Test to verify). |
| 6. At circuit breaker panel 133VU<br>- close circuit breaker 2ES and note time | Voice recorder stops running after 5 minute time delay (CVR fails BITE Test to verify) |
| 7. At overhead panel 442VU<br>- press GND CTL P/BSW/Indicator light (ON) | At overhead panel 442VU<br>- Magnetic Latch Switch (51TU) is latched on and ON indicator light comes on (blue) |
| 8. At circuit breaker panel 133VU<br>- open circuit breaker 1ES<br>(Simulating ENG1 running) | At overhead panel 442VU<br>- Magnetic Latch Switch (51TU) is unlatched and indicator light (ON) goes off |

| ACTION | RESULT |
|---|---|
| 9. At circuit breaker panel 133VU<br>- close circuit breaker 1ES | At overhead panel 442VU<br>- GND CTL indicator light (ON) remains off |

NOTE : To check only the function of Time Delay Relay 23RK it is sufficient to energize the aircraft electrical network, note the time and make certain that the CVR is running. After a time lapse of 5 minutes make certain that the CVR stops running. (During this 5 minute period neither main engines should be started).

R (4)Close-Up
(a)Disconnect headset (600 ohms) from control unit 1RK on overhead panel.
(b)De-energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
(c)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(d)Make certain that work area is clean and clear of tools and
R miscellaneous items of equipment.

R 3. Operational Test of Underwater Locator Beacon (ULB)

**ON A/C 001-005,

(Ref. Fig. 501)

**ON A/C 006-200,

(Ref. Fig. 502)

**ON A/C ALL

(Ref. Fig. 503)

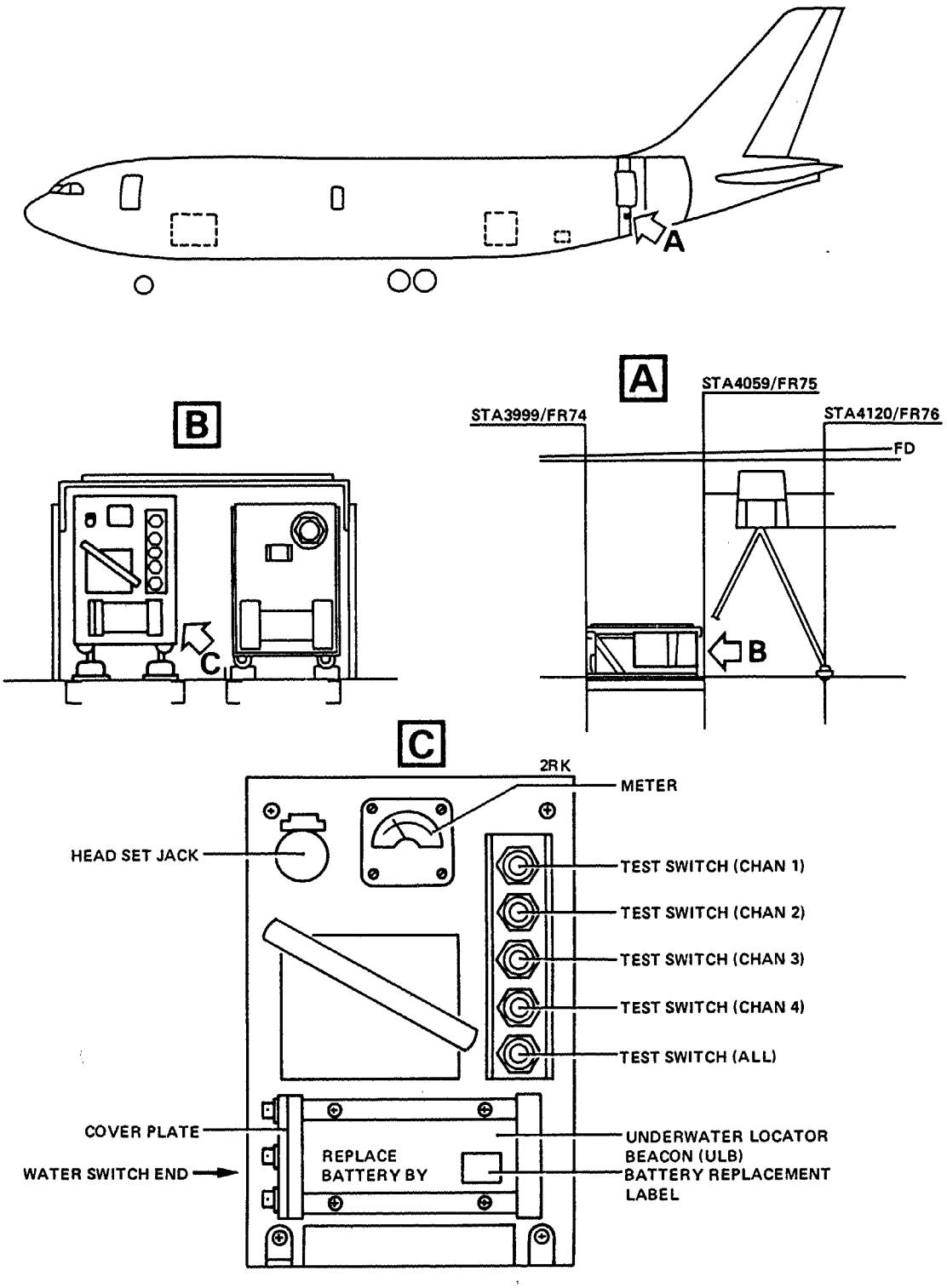
A. Operational Test of the Underwater Locator Beacon with the Ultrasonic Test Set

(1)Reason for the Job
To test the correct function of the underwater locator beacon.

NOTE : The Underwater Locator Beacon (ULB) is mounted on the front panel of the Cockpit Voice Recorder. The unit has a self-contained battery.

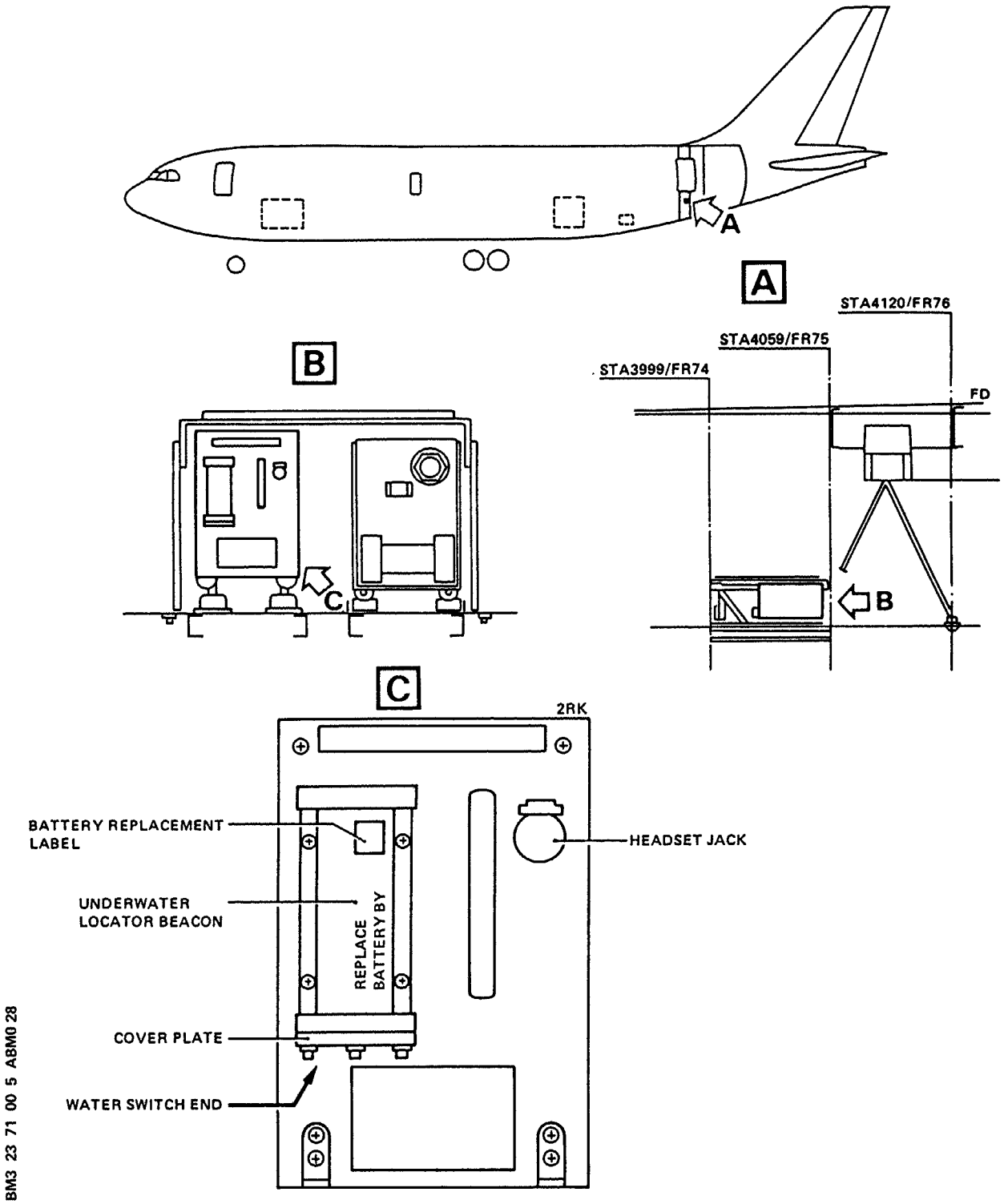
(2)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Access Platform 6 m (19 ft. 8 in.) |
| (b) | Ultrasonic Test Set (DUKANE CORP) |
| (c) | Stopwatch |

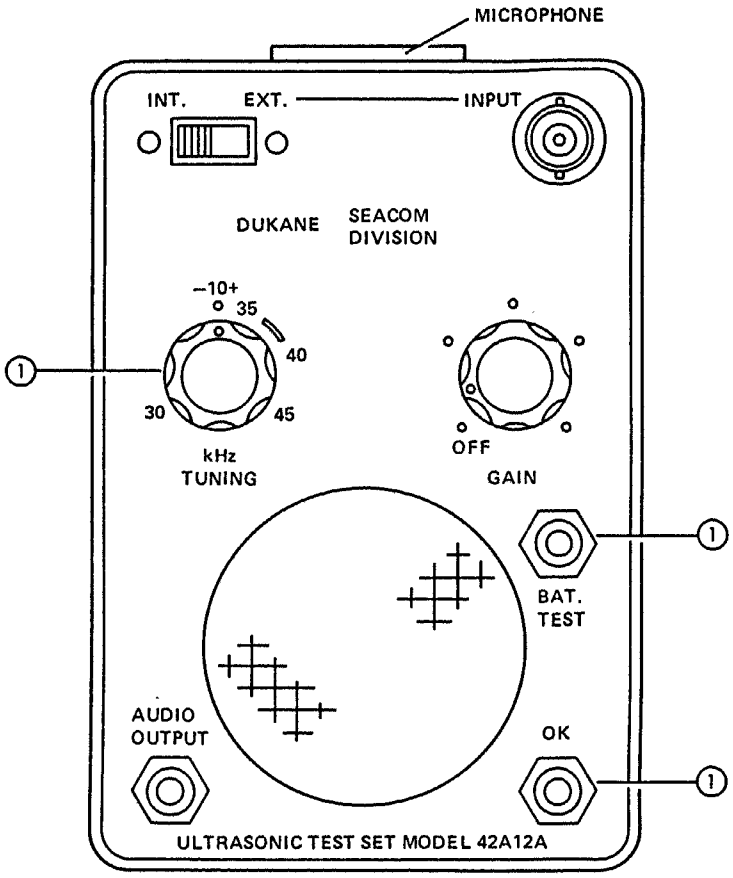



BM3 23 71 00 5 AAM0 -18

Component Location
Figure 501




Component Location
Figure 502




(1) MODEL 42A12 DOES NOT HAVE "BAT. TEST" BUTTON OR "OK" RED LAMP AND HAS A DIFFERENT TUNING SCALE.

BM3 23 71 00 5 ACM0 18

Dukane Ultrasonic Test Receiver 42A 12A
Figure 503

Referenced Procedure
- 23-71-36, P. Block 401 Under Water Locating Beacon
- 52-52-15, P. Block 401 AFT Cabin Underfloor Compartment Door

(3)Procedure
(a)Job Set-Up
1 Position access platform at BULK cargo compartment door (Zone 813).
2 Open BULK cargo compartment door (Zone 813).
R 3 Open the access door 162AZ (Ref. 52-52-15, P. Block 401).
4 Look at the batterie replacement label on the ULB.
5 Replace the ULB if life time of the batterie is reached (Ref. 23-71-36, P. Block 401).
6 On Ultrasonic Test Set
a Set the INPUT Selector to INT position.
b Activate the test set and check for operation by jingling a set of keys, coins or other available noise maker near the test set microphone.
c Set TUNING Control between 35 and 40 KHz.
d Set the GAIN Potentiometer to the maximum position.
7 Establish a temporary circuit across the water switch of the ULB by means of a metal braid or other flexible conductor.
8 Place the test set microphone as near as possible to the beacon and tune test set to get the best signal.

(b)Test with the Ultrasonic Test Set

| ACTION | RESULT |
|---|---|
| 1. With a stopwatch, count the number of pulses from the ULB during a cycle of 10 seconds. | |
| 2. Calculate the pulse rate:<br>- divide the number of pulses during the cycle by the number of seconds (10 seconds). | The pulse rate must be approximately one pulse per second. |
| 3. You can measure the pulse duration with an oscilloscope connected to the output of the test receiver. | |
| 4. You can measure the transmission frequency of the ULB with the test receiver tuned to this frequency. | On the test receiver:<br>- read the frequency at the TUNING dial. |

NOTE : In air, the pulse duration will be longer and the pulse repetition rate will be slower than during tests performed by the manufacturer. However, an accelerated or increasing pulse repetition rate indicates

that the battery must be replaced (Ref. 23-71-36 P. Block 401).
If the ULB does not function normally after batterie replacement the beacon should be replaced (Ref. 23-71-36, P. Block 401).

R (4)Close-Up
R (a)Remove the temporary circuit across the water switch of the ULB by means of a metal braid or other flexible conductor.
R (b)Make certain that working area is clean and clear of all tools and miscellaneous items of equipment.
R (c)Close the access door 162AZ (Ref. 52-52-15, P. Block 401).
R (d)Close BULK cargo compartment door (Zone 813).
R (e)Remove access platform.

B. Operational Test of the Underwater Locator Beacon with the Pinglite Tester PL 1

(1)Reason for the Job
To test the correct function of the underwater locator beacon.

NOTE : The Underwater Locator Beacon (ULB) is mounted on the front panel of the Cockpit Voice Recorder. The unit has a self-contained battery.

(2)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Access Platform 6 m (19 ft. 8 in.) |
| (b) | Pinglite Tester PL 1 (DUKANE CORP.) |
| Referenced Procedure | |
| - 23-71-36, P. Block 401 | Under Water Locating Beacon |
| - 52-52-15, P. Block 401 | AFT Cabin Underfloor Compartment Door |

(3)Procedure
(a)Job Set-Up
1 Position access platform at BULK cargo compartment door (Zone 813).
2 Open BULK cargo compartment door (Zone 813).
R 3 Open the access door 162AZ (Ref. 52-52-15, P. Block 401).
4 Look at the batterie replacement label on the ULB.
5 Replace the ULB if life time of the batterie is reached (Ref. 23-71-36, P. Block 401).
6 On Pinglite Tester PL 1
a Establish a temporary short circuit between the device water switch center pin and the case, using a piece of metal braid or flexible conductor.

(b)Test with the Pinglite Tester PL 1

| ACTION | RESULT |
|---|---|
| 1. On the pinglite tester PL 1:<br>Put the end of the tester against the ULB approximately 1 inch (25.4 mm) from water switch end. | |
| 2. Push and hold the OPERATION pushbutton on test set. | A light flash indicates that tester is operating.<br>THE BEACON indicator lamp on tester flashes with each output pulse from ULB, to verify its operation. |
| 3. Release the OPERATION pushbutton. | All indicators go off. |

NOTE : No flashing on the tester indicates a dead batterie or defective ULB. However, an accelerated or increasing pulse repetition rate indicates that the battery must be replaced (Ref. 23-71-36 P. Block 401). If the ULB does not function normally after batterie replacement the beacon should be replaced (Ref. 23-71-36, P. Block 401).

(c)Close-Up

1 Remove the temporary circuit across the water switch of the ULB.
2 Make certain that working area is clean and clear of all tools and miscellaneous items of equipment.
R 3 Close the access door 162AZ (Ref. 52-52-15, P. Block 401).
4 Close BULK cargo compartment door (Zone 813).
5 Remove access platform.

C. Operational Test of the Underwater Locator Beacon with the Pinglite Tester PL 3

(1)Reason for the Job

To test the correct function of the underwater locator beacon.

NOTE : The Underwater Locator Beacon (ULB) is mounted on the front panel of the Cockpit Voice Recorder. The unit has a self-contained battery.

(2)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Access Platform 6 m (19 ft. 8 in.) |
| (b) | Pinglite Tester PL 3 (DUKANE CORP.) |

Referenced Procedure

- 23-71-36, P. Block 401 Under Water Locating Beacon

(3)Procedure
(a)Job Set-Up
1 Position access platform at BULK cargo compartment door (Zone 813).
2 Open BULK cargo compartment door (Zone 813).
R 3 Open the access door 162AZ (Ref. 52-52-15, P. Block 401).
4 Look at the batterie replacement label on the ULB.
5 Replace the ULB if life time of the batterie is reached.
(Ref. 23-71-36, P. Block 401).

(b)Test with the Pinglite Tester PL 3

| ACTION | RESULT |
|---|---|
| 1. Put the pinglite tester PL 3 in position and push and hold it against the ULB water switch. | On the pinglite tester PL 3:<br>The LED is flashing with each output pulse.<br>A pulse sound is heard. |
| 2. Remove the tester from ULB. | |

NOTE : No flashing on the tester indicates a dead batterie or defective ULB. However, an accelerated or increasing pulse repetition rate indicates that the battery must be replaced (Ref. 23-71-36 P. Block 401). If the ULB does not function normally after batterie replacement the beacon should be replaced (Ref. 23-71-36, P. Block 401).

(c)Close-Up
1 Remove the temporary circuit across the water switch of the ULB.
2 Make certain that working area is clean and clear of all tools and miscellaneous items of equipment.
R 3 Close the access door 162AZ (Ref. 52-52-15, P. Block 401).
4 Close BULK cargo compartment door (Zone 813).
5 Remove access platform.

1. Operational Check

A. Reason for the Job
To confirm availability and aural quality of all active CVR channels.

B. Equipment and Materials

| ITEM | DESIGNATION | |
|---|---|---|
| (a) | Headset (600 ohms) | |
| Referenced Procedure | | |
| - 23-50-00, P. Block 501 | Audio Integrating | D |
| - 23-71-00, P. Block 501 | Cockpit Voice Recorder | D |
| - 24-41-00, P. Block 301 | AC External Power Control | D |

2. Procedure

A. Job Set-up
(1)Make certain that the aircraft is in GROUND configuration.
(2)Make certain that the main engines are not running.
(3)Pull up and lock parking brake control handle.
(4)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(5)Energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
(6)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | RCDR-CVR SUPPLY | 4RK | 204/F28 |
| 22VU | RCDR-CTL | 5RK | 204/F27 |
| 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS2 FLT/GND | 1GB | 331/V52 |
| 133VU | HYDRAULIC-L/G PROX DET AND RELAYS SYS1 RELAYS AND RETRACT CTL | 2GB | 332/U52 |
| 22VU | AUDIO SYS - CTL PNL CAPT | 30RN | 205/E19 |
| 22VU | AUDIO SYS - CTL PNL F/O | 31RN | 205/E20 |
| 22VU | AUDIO SYS - CTL PNL THIRD OCCUPANT | 32RN | 205/E18 |

R (7)Connect headset (600 ohms) to control unit 1RK at overhead panel.

B. Check

R NOTE : The cockpit voice recorder is automatically
R energized whenever the aircraft electrical network is
R initially energized.
R The recorder is automatically de-energized 5 minutes
R after the last engine shut down, or when the
R aircraft weight is off undercarriage, or when the

R GND CTL pushbutton switch on the overhead panel
R 442VU goes OFF.

R (1)Perform the Operational Test to confirm availability and aural quality
R of all active CVR channels
(Ref. 23-71-00, P. Block 501).

C. Close-up
(1)Disconnect headset from control unit.
(2)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
(3)De-energize the Audio Integrating System (Ref. 23-50-00, P. Block 501).
(4)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

R

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |
| Referenced Procedure<br>- 23-71-00, P. Block 501 | Cockpit Voice Recorder |

(Ref. Fig. 401)

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers :

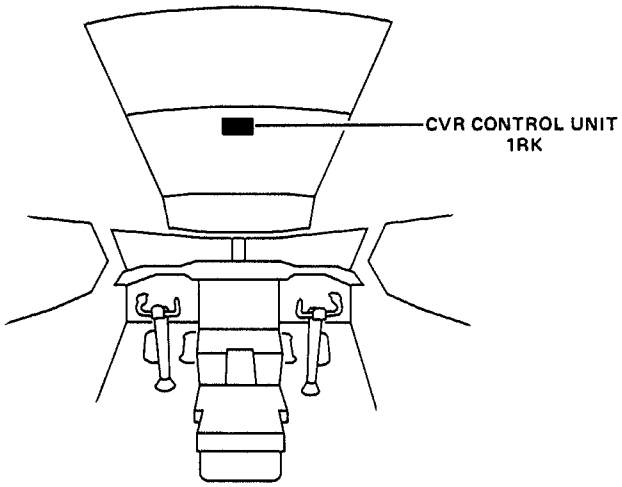
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | RCDR/CVR SUPPLY | 4RK | 204/F28 |
| 22VU | RCDR/CTL | 5RK | 204/F27 |

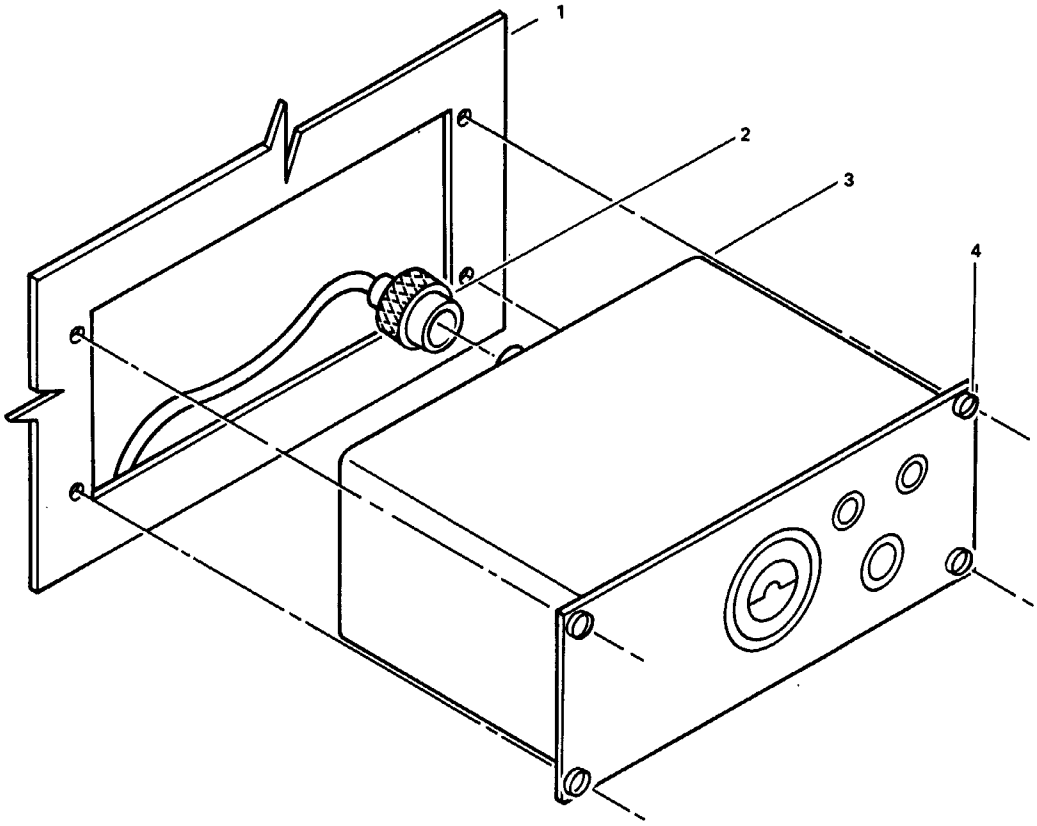
B. Removal
(1)Unlock the four Dzus fasteners (4).
(2)Withdraw CVR control unit (3) from housing (1) to disconnect electrical connector (2).
(3)Disconnect and cap electrical connector (2) and leave it free outside panel (1).
(4)Remove CVR control unit (3).

C. Installation
(1)Clean and inspect control unit interface and/or adjacent area.
(2)Remove blanking caps from electrical connector (2). Check connector for correct condition and cleanliness.
(3)Position CVR control unit (3) and connect electrical connector (2).
(4)Install CVR control unit (3) in housing (1).
(5)Lock the four Dzus fasteners (4).
(6)Remove safety clips and tags and close circuit breakers 4RK and 5RK.

D. Test
R (1)Carry out operational test of cockpit voice recorder by depressing TEST
R pushbutton switch (Ref. 23-71-00, P. Block 501, paragraph 1.A.).
R (2)Carry out operational test to confirm availability and aural quality of
R all active cockpit voice recorder channels (Ref. 23-71-00, P. Block 501,
R paragraph 1.C.).

E. Close-Up
Make certain that working area is clean and clear of tools and miscellaneous items of equipment.




BM5 23 71 12 4 TGA0.01

CVR Control unit
Figure 401

# COCKPIT VOICE RECORDER MICROPHONE (14RK) - REMOVAL/INSTALLATION

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |
| C. | Electrical Cable Clamp |
| D. Material No. 08-007 | Bonding and Adhesive Compounds (Ref. 20-31-00) |
| E. | Headset (600 Ω) |
| R F. | Standard Tools General (Ref. ESPM 20-25-00) |
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

(Ref. Fig. 401)

## 2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | RCDR/CTL | 5RK | 204/F27 |
| 22VU | RCDR/CVR SUPPLY | 4RK | 204/F28 |

B. Removal

(1)Remove the fourteen screws (3), the fourteen washers (2). Remove overhead panel (1).

(2)Disconnect electrical plug (9) from receptacle (11) and cap receptacle (11).

(3)Withdraw microphone cable from clamp (10) and discard clamp (10).

(4)Remove the two screws (7), the two washers (6) and retain microphone (8) and mounting plate (5).

(5)Remove the two screws (4); remove mounting plate (5) and microphone (8).

R (6)Remove and retain microphone connector 1913 VCA (9) (Ref. ESPM 20-25-00).

C. Preparation of Component Replacement

(1)Clean and inspect microphone area interface or/and adjacent area.

R (2)Connect connector 1913 VCA (9) to microphone (8) (Ref. ESPM 20-25-00 and AWM 23-71-02).

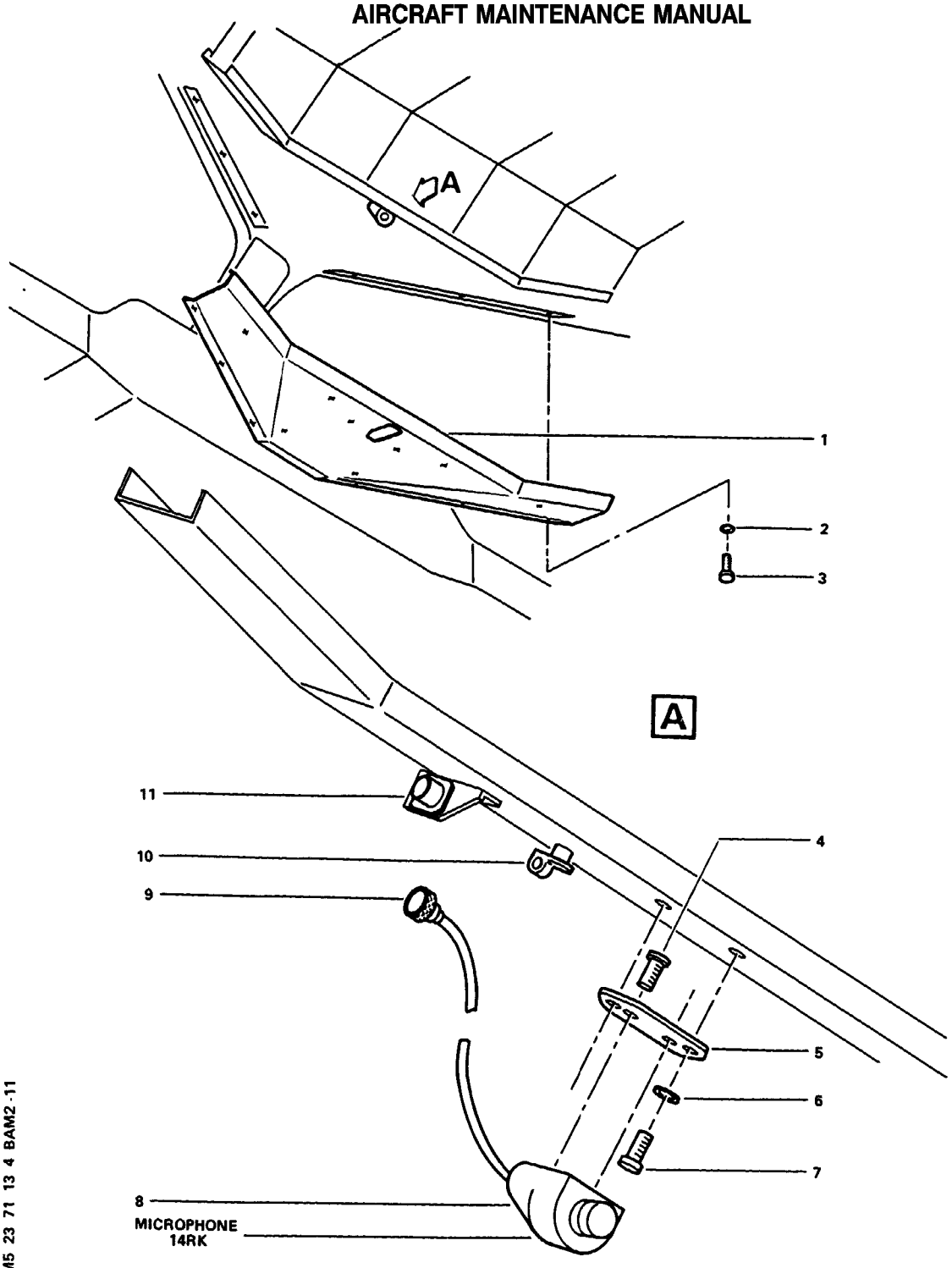
D. Installation

(1)Remove blanking caps from receptacles (11) and check connector for correct condition.

(2)Coat screws (4) with loctite Material No. 08-007. Assemble mounting plate (5) and microphone (8) and tighten the two screws (4).

(3)Install microphone (8) and mounting plate (5) on structure and attach by means of the two screws (7) and two washers (6).

(4)Attach microphone cable with new clamp (10).




Cockpit Voice Recorder Microphone
Figure 401

(5)Connect plug (9) and receptacle (11).
(6)Install overhead panel (1) and attach by means of the fourteen screws (3) and fourteen washers (2).
(7)Remove safety clips and tags and close circuit breakers 4RK and 5RK.

E. Test
(1)Make certain that the following circuit breakers are closed :

| | PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|---|
| | 133VU | L/G PROX DET & RELAYS/SYS2/FLT/GND | 1GB | 331/V52 |
| | 133VU | L/G PROX DET & RELAYS/SYS1/RELAYS OF RETRACT CTL | 2GB | 332/U51 |
| R | 22VU | RCDR/CVR SUPPLY | 4RK | 204/F28 |
| R | 22VU | RCDR/CTL | 5RK | 204/F27 |

R

(2)Energize the aircraft electrical network.
(3)Connect 600 ohm headset to control unit 1RK.

| ACTION | RESULT |
|---|---|
| 1. On panel 442VU<br>- press GND CTL pushbutton switch 51TU | On panel 442VU<br>- ON legend comes on blue |
| 2. Speak in a normal voice in flight compartment at least 4 ft. from area microphone | After 2 s. approx.<br>- recorded message is audible in headset |
| 3. On panel 442VU<br>- release GND CTL pushbutton switch 51TU | On panel 442VU<br>- ON legend goes off |

F. Close-Up
(1)De-energize the aircraft electrical network.
(2)Disconnect headset from control unit 1RK.
(3)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

WARNING : BEFORE POWER IS APPLIED TO THE AIRCRAFT MAKE CERTAIN THAT CIRCUITS UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.

1. Reason for the Job
Removal for Component Maintenance.

2. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 3.0 m (10 ft.) |

Referenced Procedures

| | |
|---|---|
| - 23-71-00, P. Block 501 | Cockpit Voice Recorder |
| - 52-30-00, P. Block 1 | Cargo Compartment Doors |
| - 52-52-15, P. Block 401 | AFT Cabin Underfloor Compartment Access Door |

3. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | RCDR-CVR SUPPLY | 4RK | F28 |
| 22VU | RCDR-CTL | 5RK | F27 |

(2)Position access platform at zone 162.
(3)Open bulk cargo compartment door (Ref. 52-30-00, P. Block 1).
(4)Open AFT cabin underfloor compartment access door 162AZ to gain access to the cockpit voice recorder (CVR) (Ref. 52-52-15, P. Block 401).

B. Removal
(1)Loosen hold-down fasteners on frame of CVR shockmount by turning the two knurled nuts.
(2)Pull down the hold-down fasteners.
(3)Remove CVR from shockmount frame.
NOTE : Ensure that the ULB (when fitted) is not damaged during CVR removal. *

C. Installation
(1)Using integral handle, push CVR carefully into shockmount frame.
NOTE : Check that guide pins are correctly located in the shockmount frame.
(2)Push up two knurled hold-down fasteners.
(3)Turn knurled nuts on hold-down fasteners until CVR is firmly seated on shockmount.

D. Test
(1)Test the CVR (Ref. 23-71-00, P. Block 501).

E. Close-Up
(1)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
(2)Close AFT cabin underfloor compartment access door 162AZ.
(3)Close bulk cargo compartment door (Ref. 52-30-00, P. Block 1).
(4)Remove access platform.

## 1. Removal/Installation of Underwater Locating Beacon

A. Reason for the Job

(1)Removal/installation of underwater locating beacon for replacement or inspection of battery.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Spanner Wrench (P/N 810-325 DUKANE CORP) |
| (2) | Access Platform 6 m (19 ft. 8 in.) |
| (3) | Ultrasonic Test Set (DUKANE CORP) |
| (4) | Stopwatch |
| (5) | Microammeter (100 $\mu$ A DC range) |
| (6)Material No. 11-005 | Cleaning Agents (Ref. 20-31-00) |
| Referenced Procedures | |
| - 23-71-00, P. Block 501 | Cockpit Voice Recorder |
| - 23-71-35, P. Block 401 | Cockpit Voice Recorder |

C. Procedure

(1)Job set-up

(a)Position access platform at zone 171.

(b)Open access door 162AZ.

(2)Removal

(Ref. Fig. 401)

(a)Remove three screws (2), retain washers (3) and remove mounting plate (1).

(b)Disengage beacon (4) from mount (5).

(3)Battery removal/installation

(Ref. Fig. 402)

(a)Support beacon (1) by means of a split hose (8).

(b)Using wrench (7) turn end cap (3) marked BATTERY ACCESS counter-clockwise. Remove O-ring (4).

(c)Remove shock cushion (5).

(d)Tap case of beacon (1) with fingers to slide out battery (6). If the shock cushion (2) comes out at the same time as the battery, replace immediately.

(e)If battery is not replaced, visually inspect battery. Check for absence of corrosion on battery contacts.

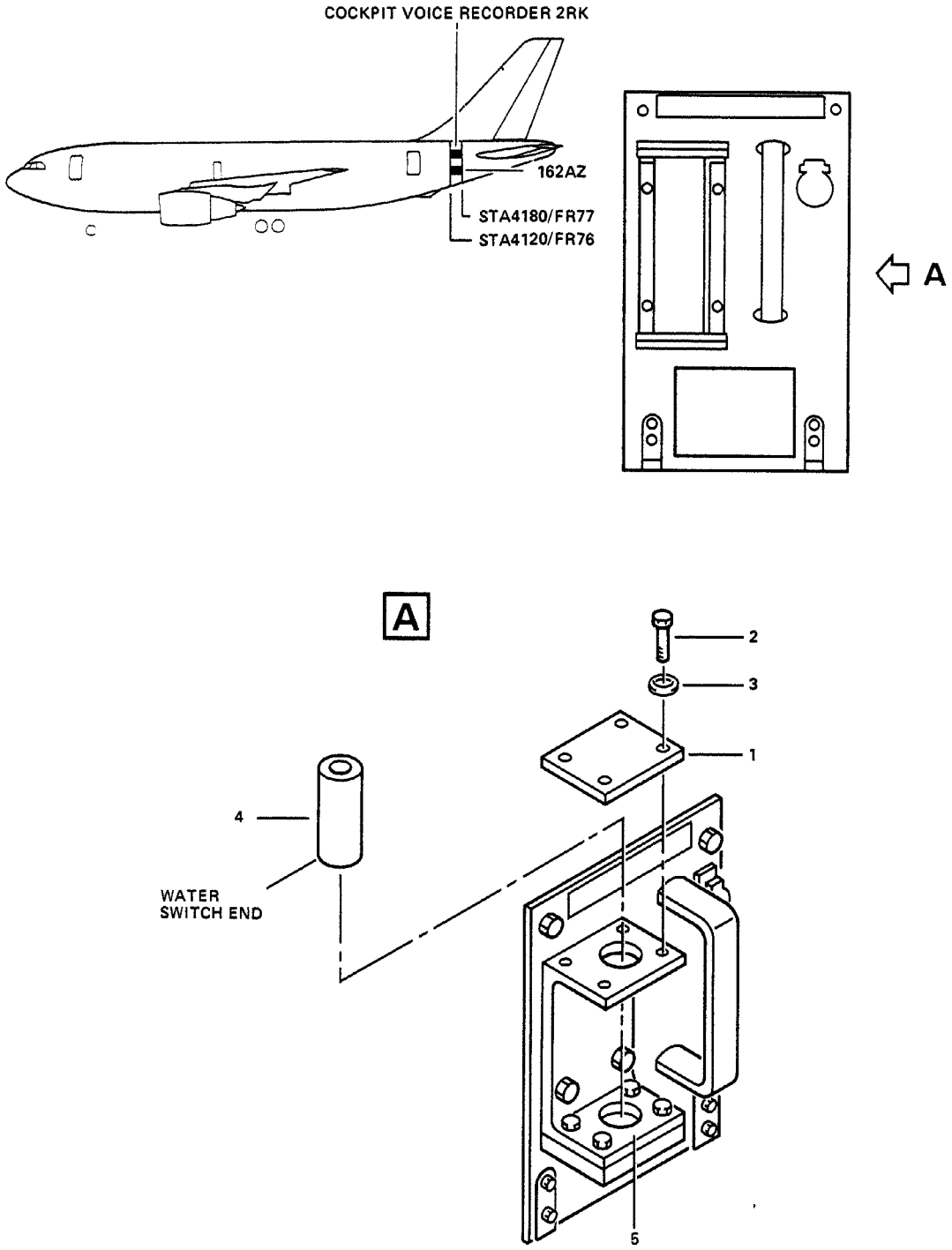
(f)If battery is replaced, affix new label indicating date of battery replacement on beacon case and cover with lacquer.

CAUTION : DO NOT AFFIX ANY LABELS, EXCEPT AS SPECIFIED ON THE BEACON BODY.

(g)Install new battery making certain that end marked INSERT THIS END is inserted first, as indicated by arrow on battery end cap.

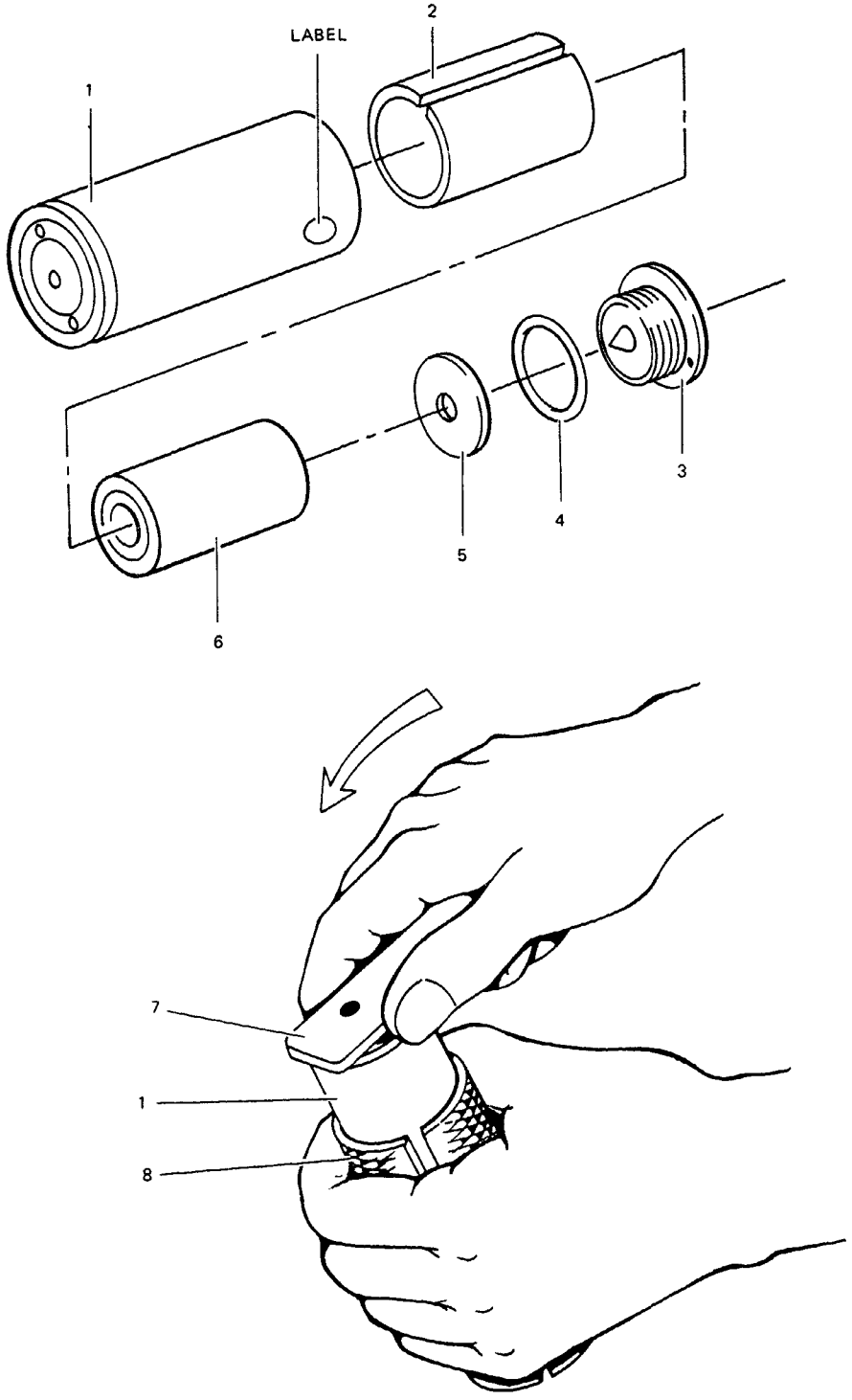
CAUTION : INCORRECT POLARITY WILL PERMANENTLY DAMAGE THE BEACON.

WARNING : INCORRECT POLARITY CAN CAUSE THE BATTERY TO EXPLODE AND CREATE A HAZARD FOR PERSONNEL.




BM5 23 71 36 4 BBR0 28

Underwater Locating Beacon
Figure 401




BM5 23 71 36 4 BJLO 08

Underwater Locating Beacon - Battery
Figure 402

(h)OFF-CURRENT-TEST
Connect + probe of microammeter on the + battery and the - probe of microammeter on the body of beacon. Check for current leakage between battery and beacon body. Leakage should be less than 2 microamperes.
(j)Clean threads and slot on O-ring (4) with cleaner and lint free cloth.
(k)Apply a thin coat of lubricant to O-ring groove and threads in body of beacon.
(l)Install O-ring (4) under end cap flange (3). Install shock cushion (5) on end cap and using wrench tighten end cap clockwise into beacon body.
(m)Clean the beacon with cleaning agent (Mat. No. 11-005).
CAUTION : DO NOT TIGHTEN BEACON IN A VICE OR SIMILAR TOOL. TIGHTEN END CAP SLIGHTLY NOT TO DAMAGE O-RING.

(4)Tests
Carry out functional test of Underwater Locating Beacon (Ref. 23-71-00, P. Block 501).

(5)Installation
(Ref. Fig. )
(a)Position beacon (4) on mount (5).
(b)Rotate the beacon so the battery replacement date label can be read.
(c)Install washers (3) and tighten three screws (2) retaining cover plate (1).
(d)Clean the beacon with cleaning agent (Mat. No. 11-005).
(e)Install CVR (Ref. 23-71-35, P. Block 401).

(6)Close-up
(a)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(b)Close access door 162AZ.
(c)Remove access platform.

# AUDIO MIXING BOX (18RK) - REMOVAL/INSTALLATION

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Blanking Caps |
| Referenced Procedures | |
| - 23-50-00, P. Block 501 | Audio Integrating System |
| - 23-71-00, P. Block 501 | Cockpit Voice Recorder |

## 2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | RCDR/CVR SUPPLY | 4RK | 204/F28 |
| 22VU | RCDR/CTL | 5RK | 204/F27 |

(2)Open access door 121BL to gain access to the audio mixing box.

B. Removal

(1)Remove the four screws (5) with washers (6).
(2)Disconnect and cap electrical connector (3) from connector (2).
(3)Remove audio mixing box (1) from mounting plate (4).

C. Installation

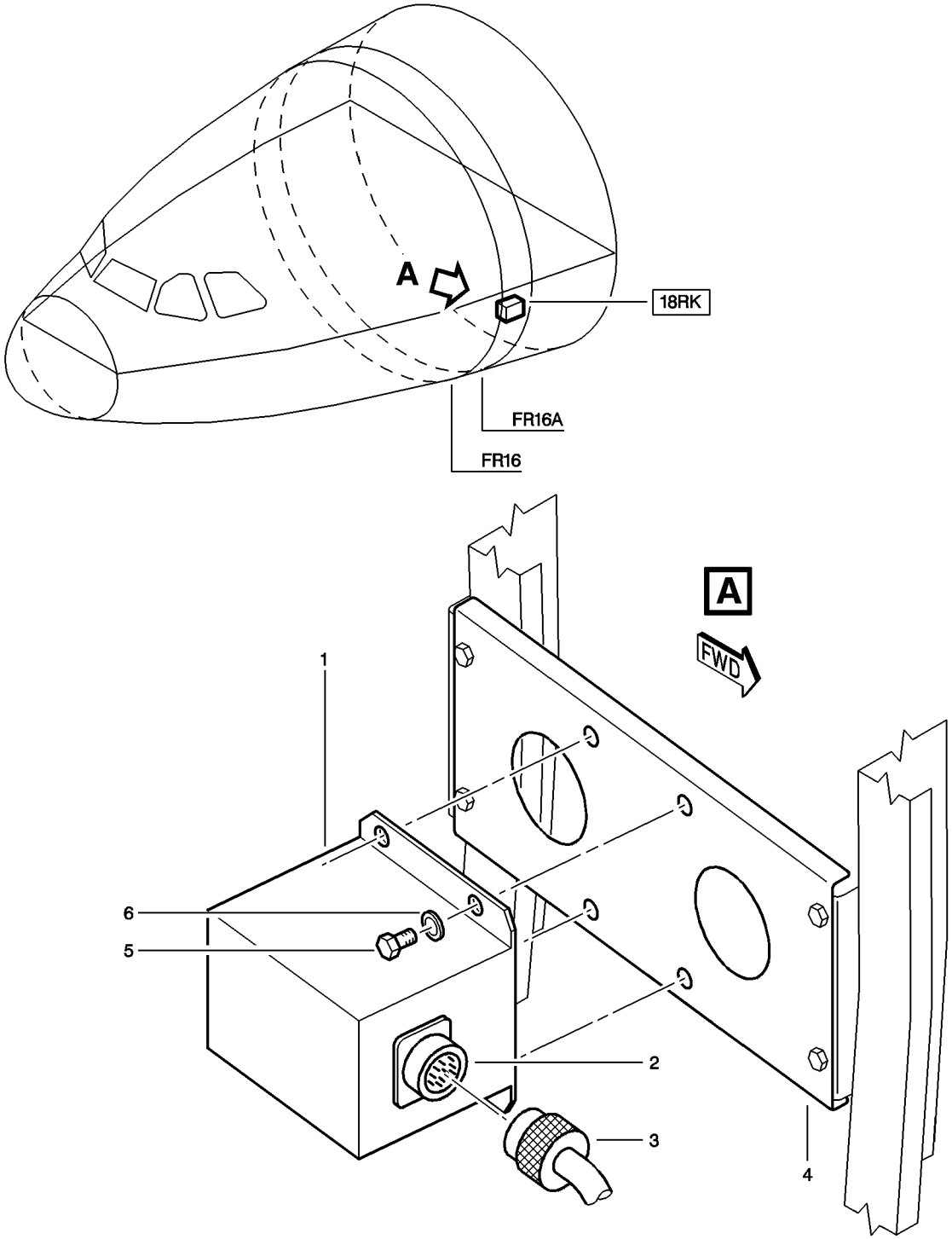
(1)Clean and inspect audio mixing box interface and/or adjacent area.
(2)Remove blanking cap from electrical connector (3).
(3)Check connector (3) for correct condition and cleanliness.
(4)Position audio mixing box (1) and connect electrical connector (3) to connector (2).
(5)Install audio mixing box (1) on mounting plate (4).
(6)Install washers (6) and the four screws (5), and tighten the screws (5) while you maintain the mounting plate (4).
(7)Remove safety clips and tags and close circuit breakers 4RK and 5RK.

D. Test

| ACTION | RESULT |
|---|---|
| 1. On overhead panel 442VU<br>- press GND CTL pushbutton switch (ON legend) | On overhead panel 442VU<br>- magnetic latch switch (51TU) is latched on and ON legend comes on (blue). |
| 2. Cover area microphone to prevent sound from being picked up and recorded on channel 4. | |

| ACTION | RESULT |
|---|---|
| 3. On 3rd Occupant Audio Selector Panel<br>- select **INT** and speak into 3 rd Occupant boomset microphone | After approximately 2 seconds, recorded speech and **TIME** signal are audible in headset connected to **CVR** control unit **(1RK)**. |
| 4. On overhead panel **442VU**<br>- press **GND CTL** pushbutton switch **(ON** legend) again | On overhead panel **442VU**<br>- magnetic latch switch **(51TU)** unlatches and **ON** legend of **GND CTL** pushbutton switch goes off. |

E. Close-up
(1)De-energize the audio integrating system (Ref. 23-50-00, P. Block 501).
(2)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
(3)Close access door 121BL.




Cockpit Voice Recorder - Audio Mixing Box -
Removal/Installation
Figure 401

# VIDEO MONITORING SYSTEM
# DESCRIPTION AND OPERATION

## 1. General

The Video Monitoring System is known as the Cockpit Door Surveillance System (CDSS). It uses cameras in the cockpit entrance and in the left and right door-1 areas. They let the flight crew monitor the door-area and identify persons who request access to the cockpit.

## 2. Component Location

(Ref. Fig. 001)
(Ref. Fig. 002)
(Ref. Fig. 003)

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF |
|---|---|---|---|---|---|
| 10RA | MONITOR | | 212 | | |
| 12RA | CAMERA-COCKPIT DOOR | | 220 | | 23-72-51 |
| 13RA | CAMERA-DR 1, LH | | 220 | | 23-72-51 |
| 14RA | CAMERA-DR 1, RH | | 220 | | 23-72-51 |

## 3. System Description

(Ref. Fig. 001, 002, 003)

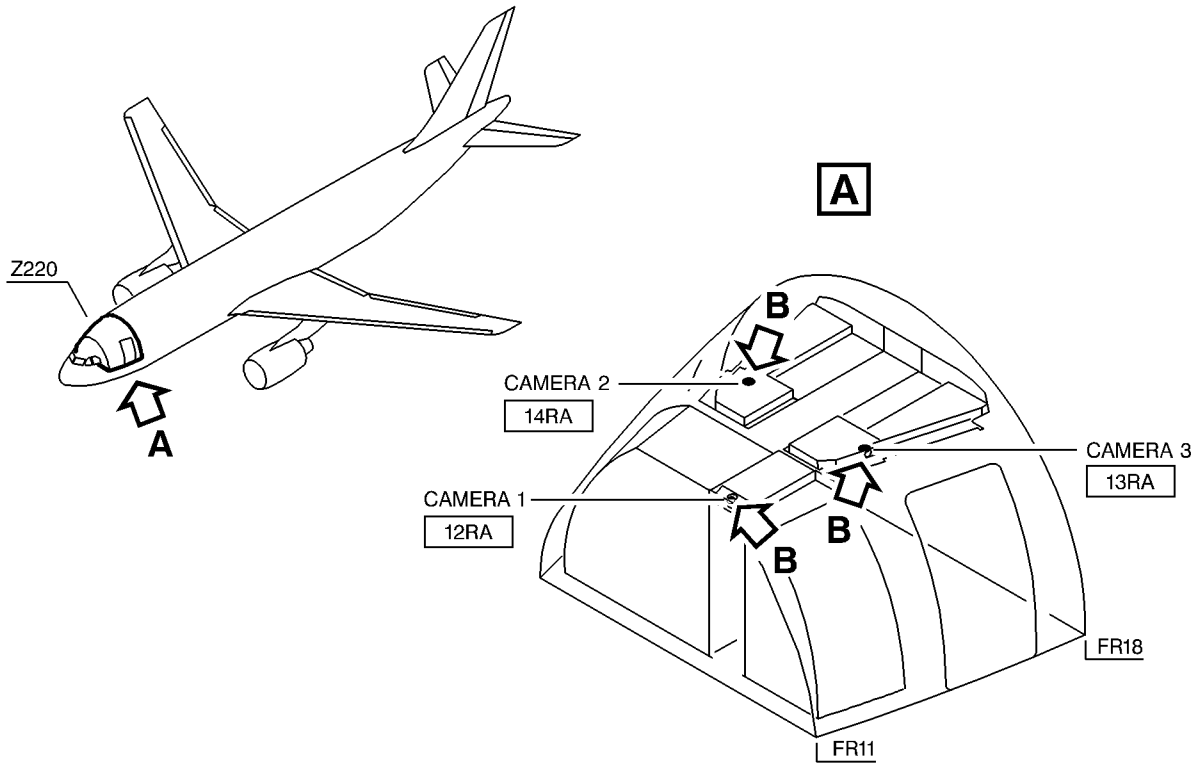
A. Cockpit Door Surveillance System has the following components:
- 3 Cameras
- 1 LCD (with a system controller)
- 1 CKPT DOOR VIDEO switch
- 1 VIDEO pushbutton.

(1)Cameras

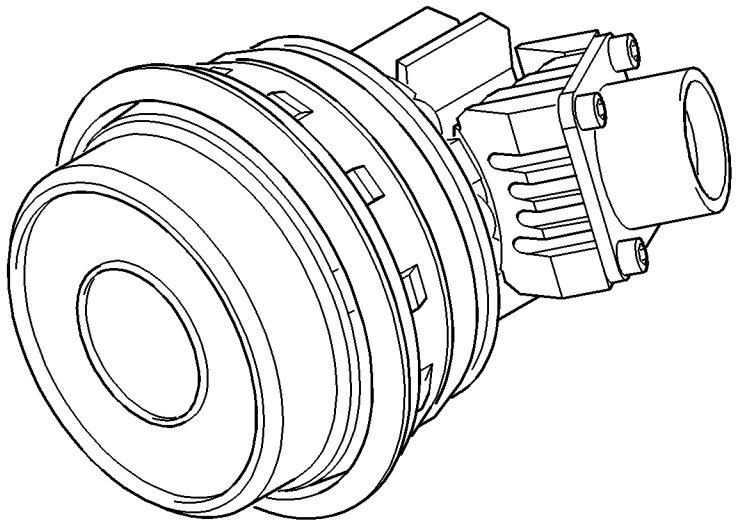
Three cameras are installed in the ceiling panels in the cockpit entrance and the door 1 area.
- camera 1 (12RA) is installed above the cockpit door. It gives the pictures of the area directly in front of the cockpit door
- camera 2 (14RA) is installed in the ceiling of the right door-1 area. It gives pictures of the area directly below camera 2 in the right door area
- camera 3 (13RA) is installed in the ceiling of the left door-1 area. It gives pictures of the area directly below camera 3 in the right door area.

(2)LCD (10RA)

The LCD is installed on the aft wall of the cockpit. It lets the flight crew see the pictures from the cameras.
The pictures from camera 1 are shown as a full screen on the LCD and the pictures from camera 2 and 3 are shown as a split screen. The pictures from camera 2 are shown left of the LCD screen and the pictures from camera 3 are shown on the right.
If the system gets no signal from the VIDEO pushbutton (16RA) or the ENTRY REQUEST KEYPAD (Ref. 52-51-00) for 5 minutes, the LCD

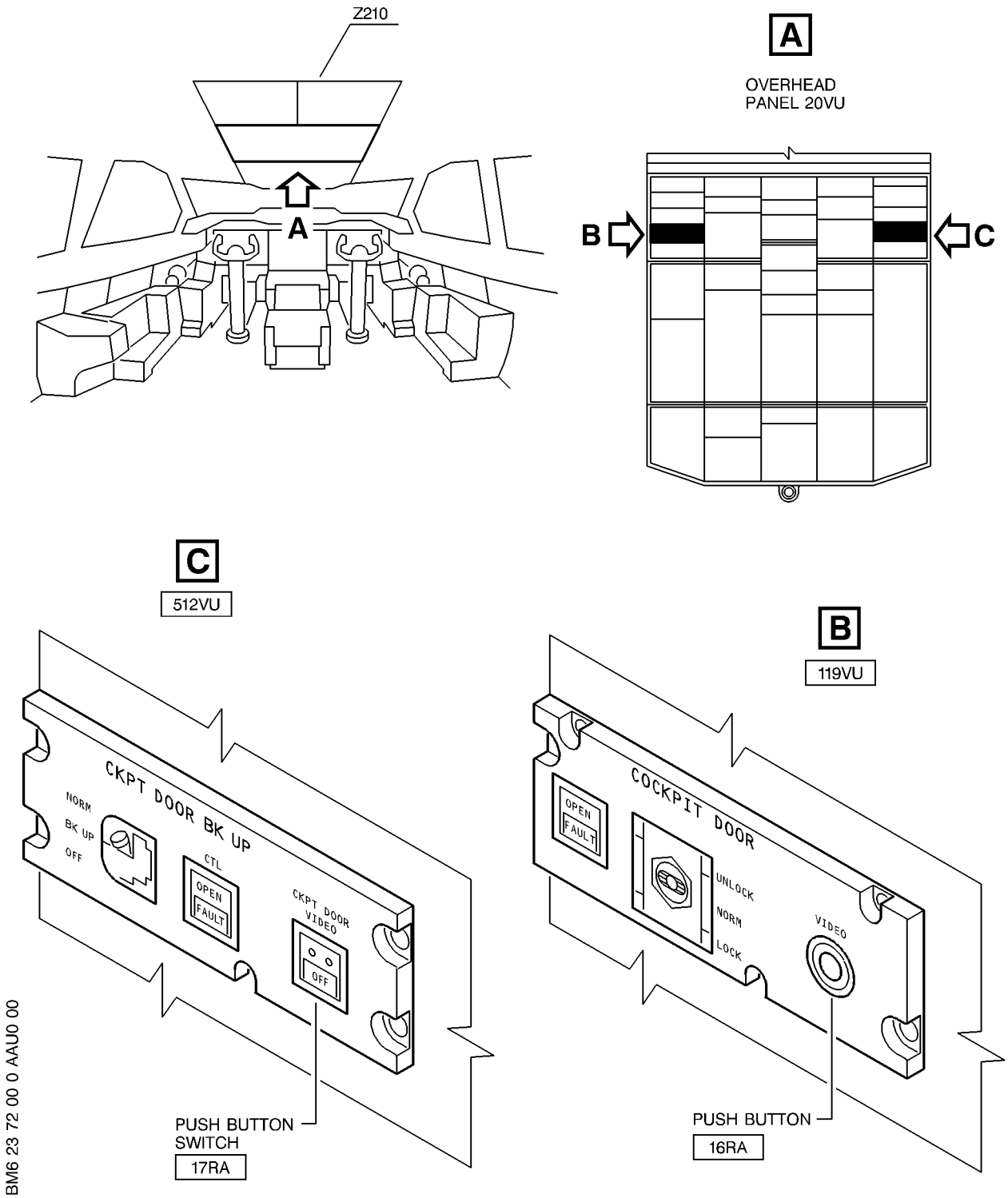



B
CAMERA
EXAMPLE

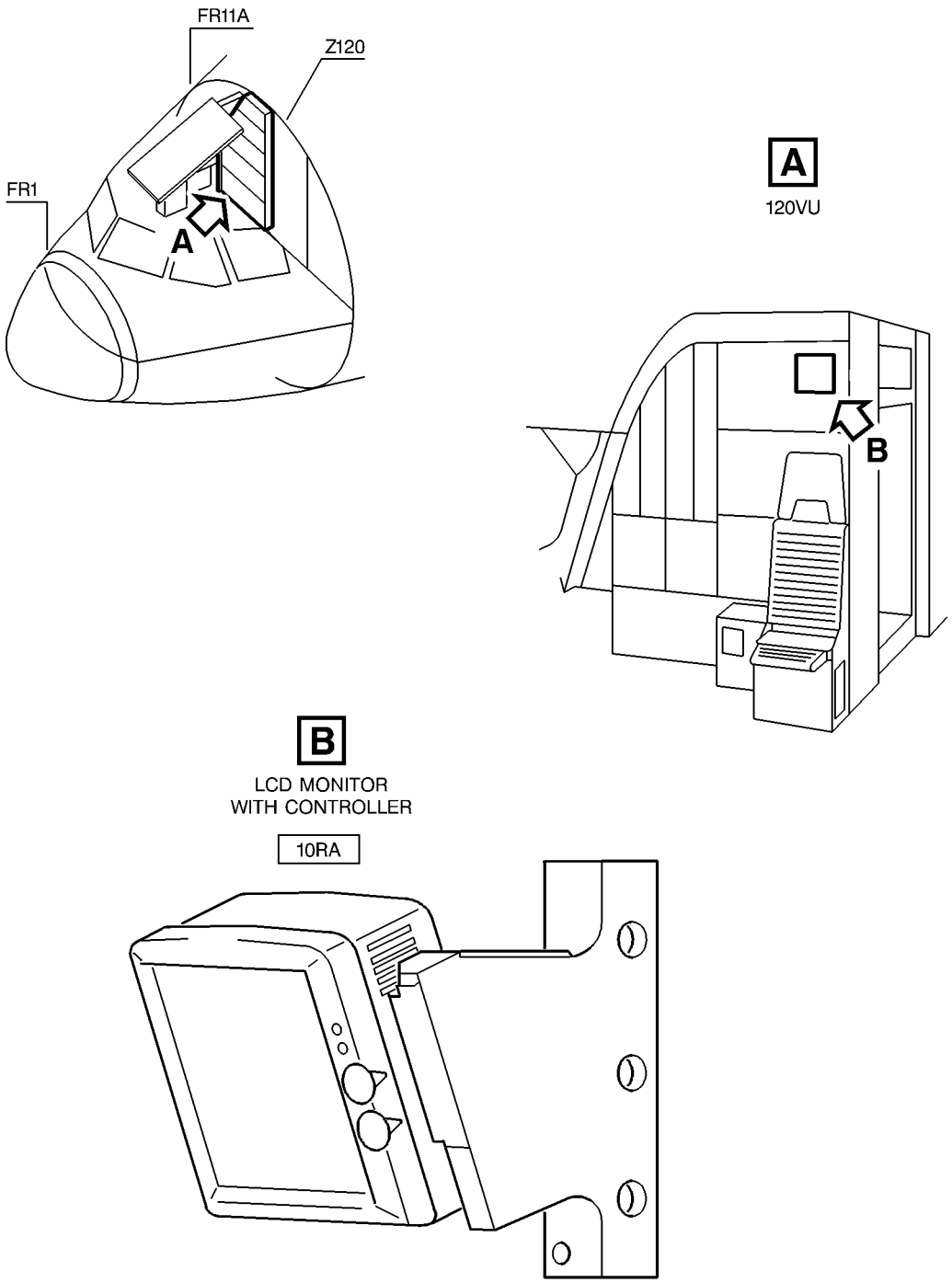


BM6 23 72 00 0 AAM0 00

Cockpit Door Surveillance System
Component-Location
Figure 001




Cockpit Door Surveillance System
Component-Location
Figure 002




BM6 23 72 00 0 AAX0 00

Cockpit Door Surveillance System
Component-Location
Figure 003

automatically goes into the standby/power save mode (blank screen).
If entry is requested with the keypad (screen is in the standby mode), the screen automatically comes on and shows the picture from camera 1. If entry is requested again before 30 seconds after the last-entry-request, the signals are inhibited. This is to let the pilot use the VIDEO pushbutton to select and view the pictures from camera 1 or cameras 2 and 3.
If the VIDEO pushbutton is pushed during the first 2 minutes of the standby/power save mode, the last shown pictures come on.
If the VIDEO pushbutton is pushed after the first 2 minutes of the standby/power save mode, the picture for camera 1 comes on.

(3)CKPT DOOR VIDEO Switch (17RA)
The CKPT DOOR VIDEO switch is installed on the overhead panel 512VU. It sets the CDSS on or off. The switch has an OFF legend which is on when the system is off and off when the system is on.

(4)VIDEO Pushbutton (16RA)
The VIDEO pushbutton is installed on the overhead panel 119VU. It lets the flight crew select between the pictures from camera 1 and from cameras 2 and 3.

(Ref. Fig. 004)

4. Power Supply

The CDSS is supplied with 28VDC from the normal busbar 101PP. The related circuit breaker 15RA is installed on the circuit breaker panel 132VU in the cockpit.
(Ref. Fig. 005)

5. Component Description

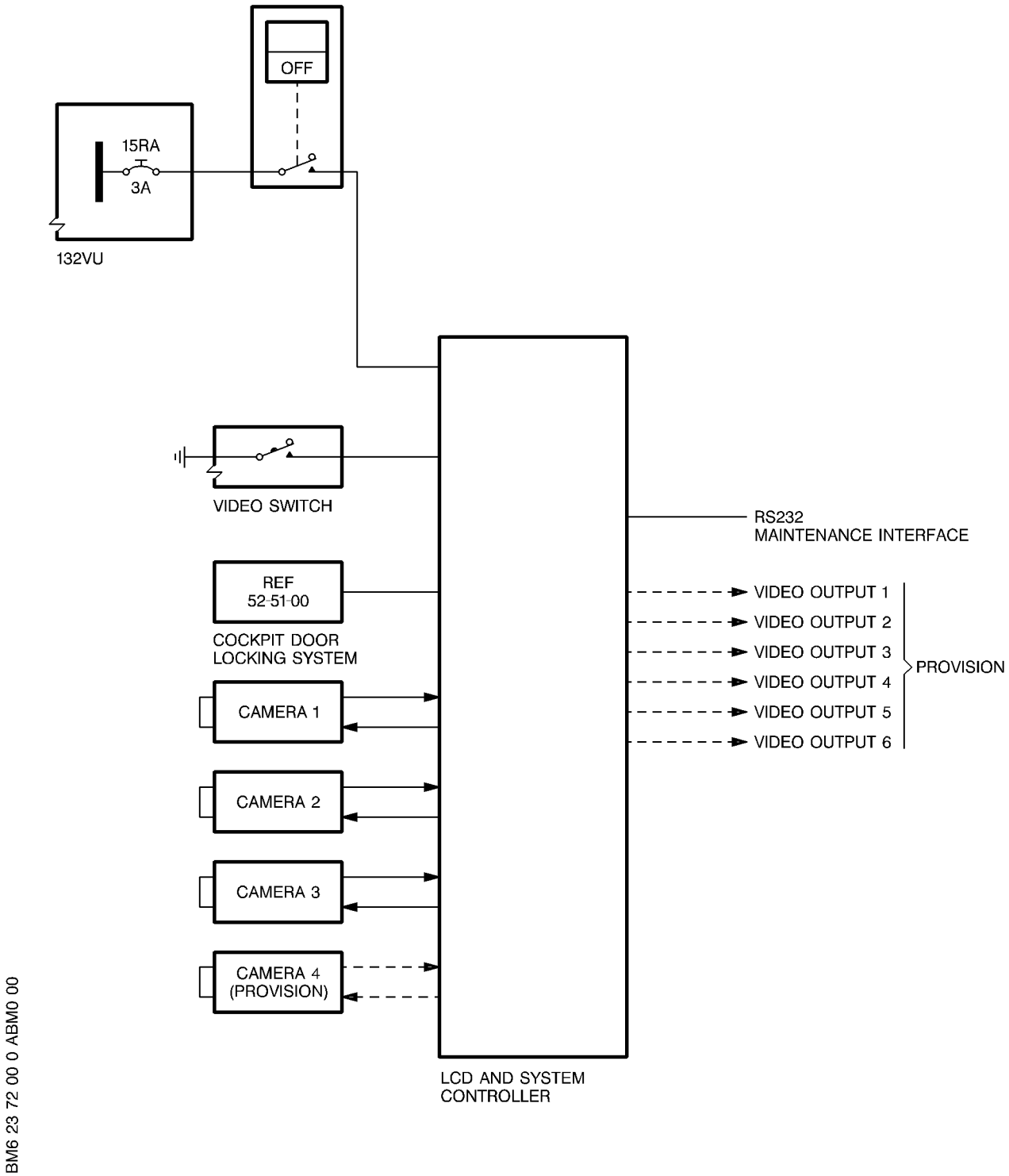
A. Cameras
Camera 1 has a 105 degree lens and cameras 2 and 3 can have a 70, 90 or 120 degree lens (as required).

B. LCD
On the front of the LCD there is one green and one white LED and two rotary knobs.
The two rotary knobs are used to manually set/adjust the screen brightness and contrast.
The green LED shows the status of the LCD:
- green LED is on, shows that the system is on
- green LED is off, shows that the system is off
- green LED is flashing, shows that a failure has occured in the system.

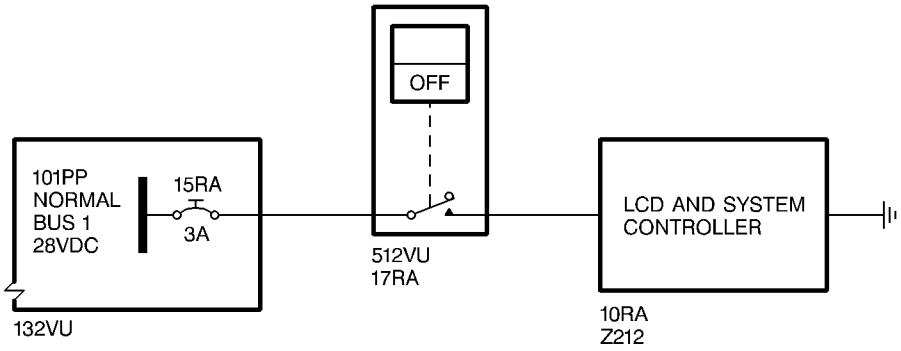
The white LED is a light sensor which automatically controls the brightness of the pictures on the LCD screen.

6. Operation/Control and Indicating

Push the CKPT DOOR VIDEO switch (17RA) on the overhead panel 512VU to start the CDSS. The picture from camera 1 shows on the LCD screen (full screen).
On the overhead panel 119VU, push the VIDEO pushbutton (16RA) to change




Cockpit Door Surveillance System
Block Schematic
Figure 004




BM6 23 72 00 0 ACM0 00

Cockpit Door Surveillance System
Power Supply
Figure 005

the picture on the LCD from camera 1 to cameras 2 and 3 (split screen). Push it again to get the pictures from camera 1 again.

7. Interface

The CDSS has interface with this system
- Cockpit Door Locking System (CDLS).

8. BITE Test

The BITE is used to detect and isolate faults related to the CDSS. If there is a failure, then the related message for the failure is shown on the LCD monitor in white text and the green LED on the LCD flashes. If there is more than one failure at the same time, then every two seconds each of the failures are shown on the screen.

A. Failure History
When the camera select switch is pushed for 10 seconds, then the failure history page shows for 60 seconds. The last 10 failures which the CDSS has found are shown on the history page and any others are deleted.

B. Failure-History-Memory Deletion
To delete the failure history memory, the CDSS must be reset.
(1)To reset the CDSS
(a)Push the CKPT DOOR VIDEO power switch (17RA) in the cockpit (OFF legend on).
(b)Push the CKPT DOOR VIDEO power switch (17RA) again (OFF legend off) and then before 5 seconds push and hold the VIDEO pushbutton (16RA) (camera select) for 5 seconds.
(c)After 5 seconds the subsequent text shows on the LCD screen:
"Clear Failure History?
YES - Press Camera Select (VIDEO pushbutton 16RA)
Wait 15 seconds".

1. Operational Test

A. Reason for the Job
(1)Operational test of Video Monitoring System.
(2)Bite Test of Video Monitoring System.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit<br>3 Phase 115 V/200 V, 400 Hz |
| Referenced Procedures | |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 52-51-00, P. Block 501 | Fixed Interior Door in Pass. Compt.<br>Adjustment/Test |

C. Procedure
(1)Job Set-Up
(a)Connect the electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that the electronic rack ventilation is correct.
(c)Make certain that the following circuit breaker is closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 132VU | CKPT/DOOR VIDEO/SPLY | 15RA | K75 |

(2)Operational test of the Video Monitoring System.

| ACTION | RESULT |
|---|---|
| 1. In the cockpit, on panel 512VU:<br>- push the 'CKPT DOOR VIDEO' pushbutton switch. | In the cockpit:<br>- the OFF legend in the 'CKPT DOOR VIDEO' pushbutton switch goes off.<br><br>In the cockpit on the LCD:<br>- the green LED comes on<br>- the LCD monitor shows the images from camera 1. |
| 2. In the cockpit, on panel 119VU:<br>- push the 'VIDEO' pushbutton one time. | In the cockpit, on the LCD monitor:<br>- the left half of the LCD monitor screen shows the images from camera 2<br>- the right half of the LCD monitor screen shows the images of |

| ACTION | RESULT |
|---|---|
| | camera 3. |
| 3. In the Cockpit, on the panel 119VU:<br>- push the 'VIDEO' pushbutton one time. | In the cockpit, on the LCD monitor:<br>- the LCD monitor shows the images from camera 1. |
| 4. In the cockpit, on the LCD monitor:<br>- turn the LCD monitor brightness knob clockwise then counter-clockwise. | In the cockpit, on the LCD monitor:<br>- the brightness of the images change. |
| 5. In the cockpit, on the LCD monitor:<br>- turn the LCD monitor contrast knob clockwise then counter-clockwise. | In the cockpit, on the LCD monitor:<br>- the contrast of the images change. |
| 6. In the cockpit, on the LCD monitor:<br>- turn the brightness and the contrast knobs to their center positions. | |
| 7. In the cockpit, on the LCD monitor:<br>- use a flashlight to increase the light on the light sensor, switch the flashlight on. | In the cockpit, on the LCD monitor:<br>- the brightness of the images change. |
| 8. In the cockpit, on the LCD monitor:<br>- decrease the light on the light sensor, switch the flashlight off. | In the cockpit, on the LCD monitor:<br>- the brightness of the images change. |
| 9. In the cockpit, on panel 119VU:<br>- push the 'VIDEO' pushbutton one time. | In the cockpit, on the LCD monitor:<br>- the left half of the LCD monitor screen shows the images from camera 2<br>- the right half of the LCD monitor screen shows the images from camera 3<br>- after five minutes the images go off (Stand-by mode). |
| 10. In the cockpit, on the panel 119VU:<br>- before the images on the LCD monitor go off for 30 seconds, push the 'VIDEO' pushbutton one time. | In the cockpit, on the LCD monitor:<br>- the images from camera 2 and camera 3 are shown (split screen).<br>- after 5 minutes, the images go off (power-down mode). |
| 11. In the cockpit entrance area | In the cockpit: |

| ACTION | RESULT |
|---|---|
| on the keypad 25MQ:<br>- enter the code to request entry to the cockpit (Ref. 52-51-00, P. Block 501). | - the horn is heard<br>- on the LCD monitor the image from camera 1 is shown. |
| 12. In the cockpit on the panel 119VU:<br>- push the 'VIDEO' pushbutton one time. | In the cockpit on the LCD monitor:<br>- the images from camera 2 and 3 are shown (split screen). |
| 13. In the cockpit entrance area, on the keypad 25MQ:<br>- after the images from camera 2 and camera 3 are shown on the LCD monitor and before 29 seconds request entry to the cockpit. | In the cockpit on the LCD monitor:<br>- the images from camera 2 and camera 3 are shown (split screen). |
| 14. In the cockpit, on the panel 119VU:<br>- push the 'VIDEO' pushbutton one time. | In the cockpit, on the LCD monitor:<br>- the image from camera 1 is shown. |
| 15. In the cockpit on the panel 512VU:<br>- push the 'CKPT DOOR VIDEO' pushbutton switch. | In the cockpit on the panel 512VU:<br>- the 'OFF' legend in the 'CKPT DOOR VIDEO' pushbutton switch comes on.<br><br>In the cockpit on the LCD monitor:<br>- the green LED goes off<br>- the screen goes off. |

(3)Bite Test of Video Monitoring System

| ACTION | RESULT |
|---|---|
| 1. In the cockpit, on panel 512VU:<br>- push the 'CKPT DOOR VIDEO' pushbutton switch. | In the cockpit on the panel 512VU:<br>- the OFF legend in the 'CKPT DOOR VIDEO' pushbutton switch goes off.<br><br>In the cockpit, on the LCD monitor:<br>- the green LED comes on (continuously) the images from camera 1 are shown. |
| 2. In the cockpit, on the panel 119VU:<br>- push and hold the 'VIDEO' pushbutton for 10 seconds. | In the cockpit on the LCD monitor:<br>- the failure history page is shown for 60 seconds. |
| 3. In the cockpit, on the panel 512VU:<br>- push the 'CKT DOOR VIDEO' | In the cockpit on the panel 512VU:<br>- the 'OFF' legend in the 'CKPT DOOR |

| ACTION | RESULT |
|---|---|
| pushbutton switch. | VIDEO' pushbutton switch comes on.<br><br>In the cockpit on the LCD monitor:<br>- the green LED goes off<br>- the screen goes off. |

(4)Close-Up
(a)De-energize the AC-External Power Control (Ref. 24-41-00, P. Block 301).
(b)Make sure that the work area is clean and clear of tools and miscellaneous items of equipment.

# CAMERA - ANTI HIJACK SYSTEM
# REMOVAL/INSTALLATION

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Blanking Caps |
| B. | Circuit Breaker Safety Clips |

Referenced Procedures

| | |
|---|---|
| - 23-72-00, P. Block 501 | Video Monitoring System Adjustment and Test |
| - 24-41-00, P. Block 301 | AC External Power Control |

(Ref. Fig. 401)

## 2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 132VU | CKPT/DOOR VIDEO/SPLY | 15RA | K75 |

B. Removal (Ref. Fig. 401)

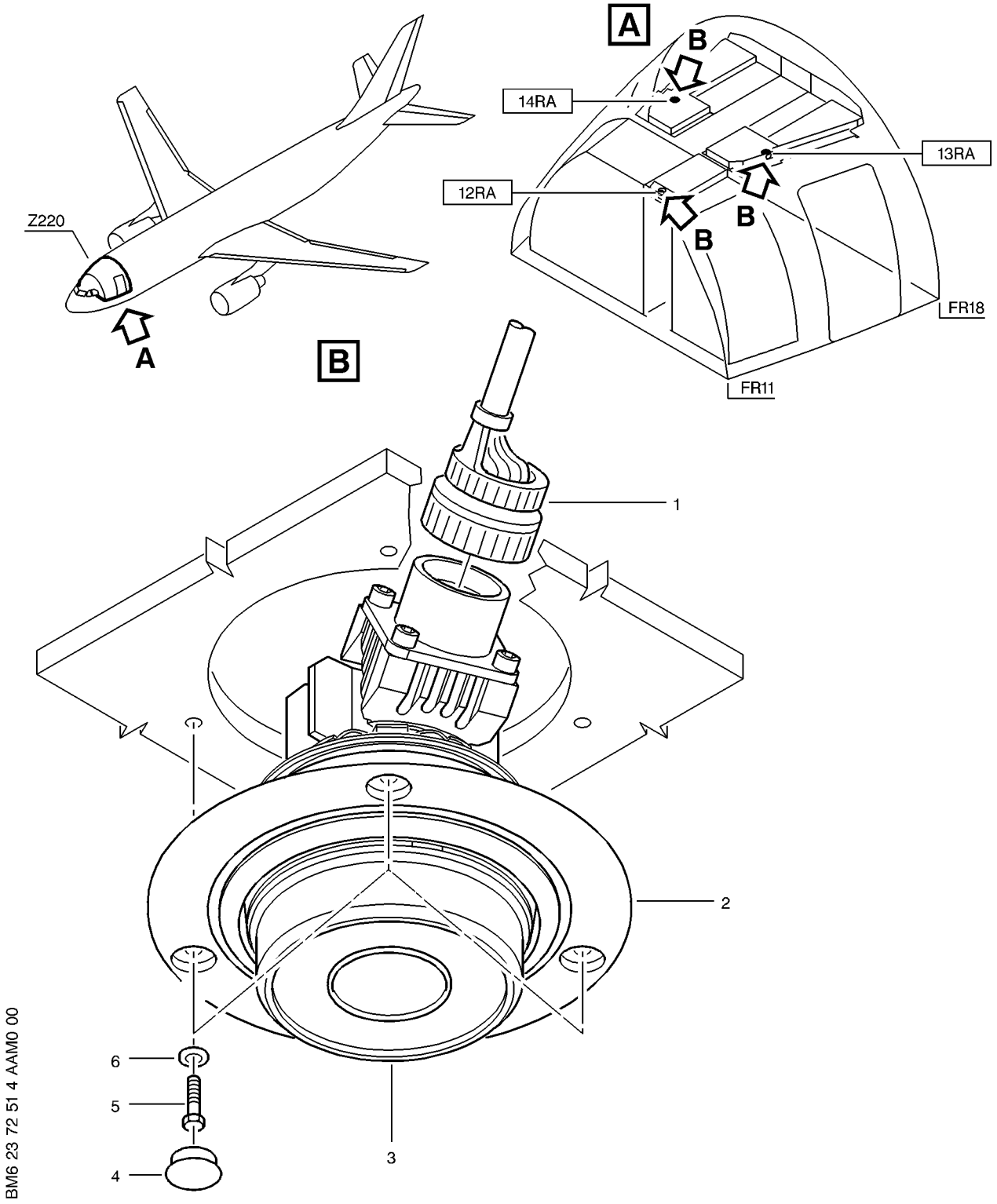
NOTE : The removal procedure for all the cameras is the same. Only one procedure is given.

(1)Remove the caps (4).
(2)Make a note of the position of the camera (3) for the installation.
(3)Hold the camera (3) in position.
(4)Remove the screws (5) and the washers (6).
(5)Carefully remove the camera (3) until you can disconnect the electrical connector (1).
(6)Disconnect the electrical connector (1) and remove the camera (3).
(7)Put blanking caps on the disconnected electrical connectors.

C. Preparation of Replacement Component

NOTE : Do the subsequent steps if you install a new camera.

(1)On the old camera (3):
  (a)Make a note of the position of the adapter plate (2).
  (b)Carefully remove the clip which keeps the adapter plate (2) in position.
  (c)Remove the adapter plate (2).
(2)On the new camera (3):
  (a)Put the adapter plate (2) in position as noted in step (1).
  (b)Install the clip which keeps the adapter plate (2) in position on the




Camera
Figure 401

camera (3).

D. Installation of the Cameras (Ref. Fig. 401)

NOTE : The installation procedure for all the cameras is the same. Only one procedure is given.

(1)Clean the component interface and/or the adjacent area.
(2)Do a visual inspection of the component interface and/or the adjacent area.
(3)Remove the blanking caps from the electrical connectors.
(4)Make sure that the electrical connectors are clean and in the correct condition.
(5)Put the camera (3) in position until you can connect the electrical connector (1).
(6)Connect the electrical connector (1).
(7)Put the camera (3) in the correct position as noted in the removal.

NOTE : The electrical connector (1) must point forward.

(8)Install the washers (6) and the screws (5).
(9)Install the caps (4).
(10)Make sure that the work area is clean and clear of tools and other items.

E. Adjustment
(1)Job Set-Up
(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that the electronics rack ventilation is correct.
(2)Adjustment of the Cameras
(a)Close the circuit breaker 15RA (CKPT/DOOR VIDEO/SPLY) on Circuit Breaker Panel 132VU /K75.
(b)In the cockpit on panel 512VU, push the CKPT DOOR VIDEO pushbutton switch (17RA).
Make sure that:
- the OFF legend in the pushbutton switch (17RA) goes off,
- the green LED on the related LCD comes on,
- the picture from camera 1 is shown.
(c)Make sure that the middle of the picture shows the area which is 100 cm (39.4 in.) in front of the cockpit door.
(d)If the picture is not correct, do the manual adjustment of the camera as necessary.
(e)In the cockpit, on the panel 119VU push the pushbutton VIDEO (16RA) one time.
Make sure that:
- in the cockpit on the LCD monitor, the pictures from camera 2 and camera 3 are shown on a split screen.
(f)Make sure that the picture from camera 2 is on the left half of the LCD screen.
(g)Make sure that the middle of the picture shows the area 120 cm (47.2 in.) in front of the right door and in the middle of the FWD

and AFT walls.

(h)Make sure that the picture for camera 3 is on the right half of the LCD screen.

(j)Make sure that the middle of the picture shows the area 120 cm (47.2 in.) in front of the left door and in the middle of the FWD and AFT walls.

(k)If the pictures for camera 2 and 3 are not correct, do the manual adjustment of the cameras as necessary.

(l)In the cockpit on the panel 512VU, push the CKPT DOOR VIDEO pushbutton switch 17RA.
Make sure that:
- the green LED on the related LCD goes off,
- the OFF legend in the pushbutton switch comes on.

F. Test

(1)Do the operational test of the Video Monitoring System (Ref. 23-72-00, P. Block 501).

G. Close-Up

(1)Make sure that the work area is clean and clear of tools and other items.

(2)De-energize the electrical network and disconnect the ground power unit (Ref. 24-41-00, P. Block 301).